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PROPOSED AND RECOMMENDED THREATENED AND ENDANGERED PLANT SPECIES OF THE FOREST SERVICE ROCKY MOUNTAIN REGION

AN ILLUSTRATED GUIDE
TO CERTAIN SPECIES IN
COLORADO
WYOMING
SOUTH DAKOTA
NEBRASKA
AND
KANSAS

U.S. Department of Agriculture
Forest Service
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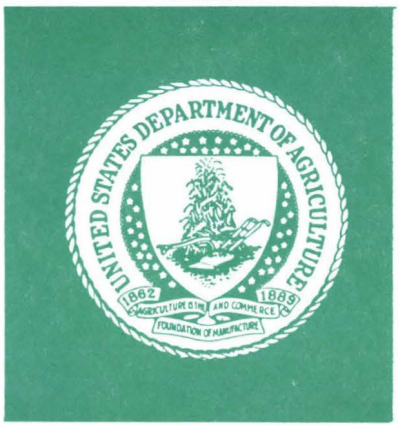

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PROPOSED AND RECOMMENDED ENDANGERED AND THREATENED PLANT SPECIES OF THE FOREST SERVICE, ROCKY MOUNTAIN REGION

By agreement with the U.S. Fish and Wildlife Service, the U.S. Forest Service has made additions and modifications to the original publication, "An Illustrated Guide to the Proposed Threatened and Endangered Plant Species in Colorado," prepared in April 1978 by Ecology Consultants, Fort Collins, Colorado, for the U.S. Fish and Wildlife Service, Lakewood, Colorado. The purpose is to produce a more detailed document for in-service use.

Forest Service additions and corrections by Barry C. Johnston, Botanist, USDA, Forest Service, Region 2, Lakewood, Colorado, January 1979.

Contributors to USFWS edition: Scott Ellis, Patricia Fay

Line Drawings in USFWS edition: Paula Nicholas

Cover: Sullivantia purpusii, photograph by Barry C. Johnston, USFS

Since printing, but before distribution of this guide, the following plant species have been classified as either Endangered or Threatened:

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Pediocactus knowltonii	E	p-45
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The common name of *Sclerocactus glaucus* is now Unita Basin Hookless Cactus. p-47

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1/ Proposed as Endangered, June 16, 1976. Exceptions are Neoparrya lithophila, Oxytropis obnapiformis, Trifolium lemonii, and Astragalus lutosus, which were listed as Endangered on the July 1, 1975, list but were deleted from the 1976 list.

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5/ Proposed as Endangered, June 16, 1976. Exceptions are Neoparrya lithophila, Oxytropis obnapiformis, Trifolium lemmonii, and Astragalus lutosus, which were listed as Endangered on the July 1, 1975, list but were deleted from the 1976 list.

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I. INTRODUCTION

The Endangered Species Act of 1973 authorized the Smithsonian Institution to prepare a list of possible endangered and threatened plant species in the continental United States. An "endangered" species is "any species which is in danger of extinction throughout all or a significant portion of its range." A "threatened" species is "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range."

The accepted interpretation of this definition of species of plants is that any species, subspecies, or variety of plant is eligible for consideration as an endangered or threatened species.

The Smithsonian Institution submitted a Report to Congress on December 15, 1974, which summarized recommendations for preserving endangered and threatened plants, and provided a list of endangered and threatened species. It was suggested that preservation of native habitats was the best method to ensure the survival of endangered species, that continued study was necessary to reevaluate the proposed status of the species, and that special efforts were necessary to protect species threatened by commercial or private exploitation.

The second part of the Smithsonian Report is five lists: Commercially Exploited Species, Extinct Species, Endangered Species, Threatened Species, and Hawaiian Species in three categories. The first two lists, Exploited and Extinct Species, have no official status under the law. Exploited Species must necessarily be categorized as endangered or threatened; Extinct Species must be reevaluated. Several species listed in the Smithsonian Report as Extinct have been since rediscovered. These have either proved to be truly endangered or else problems of taxonomic definition of the species.

The lists contained in the Smithsonian Report were republished in the Federal Register on July 1, 1975. The list of Exploited Species was not included.

A revised list was published in the Federal Register on June 16, 1976, as a Proposed Rule, and included only species proposed as endangered. An addendum list consisting of Extinct and Commercially Exploited species was included. The proposed threatened list has not been revised since the Smithsonian Report.

The species classified as threatened in this guide are plants which were included on the 1975 Review of Status List. The species classified as endangered in the guide were included on the 1976 List, with the exception of three species: Neoparrya lithophila Mathias, Oxytropis obnapiformis C. L. Porter, and Trifolium lemmonii Wats.

It is anticipated that many changes will be made in the proposed list as more is learned about the distribution and biology of the proposed species. The Colorado Native Plant Society has prepared a supplemental list and has carefully reviewed the Federal List to determine which species are deserving of protection and those which should be deleted. It is hoped that this guide will provide a starting point for the revisions needed in the Federal List.

The original "Illustrated Guide" (An Illustrated Guide to the Proposed Threatened and Endangered Plant Species of Colorado) was prepared to provide the botanical community, land managers, and other interested persons, a reference describing and locating the 50 plant species currently proposed by the Fish and Wildlife Service as endangered or threatened in Colorado. It was intended to assist managers of government agencies to determine the presence of these species and define management programs for their protection, as well as to stimulate interest in learning more about the distribution and biology of the listed species.

Because of much additional data gathered in 1978, the U. S. Forest Service, Rocky Mountain Region, has prepared this modification of the "Illustrated Guide." In general, the format has been retained, but a few Colorado specimens, thought to possess some qualities which might justify their inclusion in the Proposed List, have been added as well as species of interest from Wyoming, South Dakota, and Nebraska.

For the purposes of this modification, there is a difference between the terms "proposed" and "recommended." The term "proposed" as used here indicates a species that has appeared in any of the three Federal published lists (U.S. Fish and Wildlife Service, 1975 and 1976, and Smithsonian, 1974). The other terms, "recommended," "suggested," etc., indicate species that appear on other lists or that have been mentioned as candidates by other people, for example, Dorn 1976, Colorado Native Plant Society 1978, Smithsonian 1978, or Weber and Johnston 1976.

The pages of the original "Illustrated Guide" have been left intact, and the pages of the USDA Forest Service supplement have been interleaved with them. The Forest Service supplemental pages have been so labeled, and are either prints of color photographs or have been printed on blue paper. A new Table of Contents has been prepared to replace the old one, and an index to plant species and one to land management agencies have been added.

For each species, the SCIENTIFIC NAME, ORIGINAL DESCRIPTION, and COMMON NAME(S) are cited. Scientific names are consistent with the Federal List, although another name by which a species is

known sometimes follows in brackets. The original description is cited. The description accompanying a revised name is cited when a major generic or specific taxonomic revision was made for a species. Common names are those found in the literature (Nickerson et al. 1976). In most cases no common names exist for these species, and a general common name is listed (e.g. milkvetch for Astragalus).

KNOWN DISTRIBUTION includes county and geographical feature(s) for all species for which adequate data exist. The known distribution is based on literature reviews and examination of herbaria. Additional information on distribution is solicited by the authors from interested persons. The known distribution includes all available past and present records; no attempt was made to distinguish historical from current distribution.

HABITAT includes soil, exposure, and elevation factors that have been noted from field observations. Habitat information was derived from original descriptions, herbarium labels, and conversations with people familiar with the habitats.

A DESCRIPTION is abstracted from the original description or other source to provide information on the growth habit and key characteristics of the foliage, flower, and fruit. Key characteristics are provided to distinguish similar species. Phenological data are provided to assist the field botanist in locating the species at the proper phenological stage for positive identification.

TAXONOMIC PROBLEMS are discussed where a species is known to be difficult taxonomically. The purpose of this section is to point out areas where further taxonomic study is needed.

EXISTING OR POTENTIAL THREATS have been identified where known. Threats include detrimental actions by man that have been observed in the vicinity of plant populations, or planned actions that might affect the continued existence of these populations.

OWNERSHIP/MANAGEMENT responsibility has been identified where plant population locality data are available. In some cases several owner/management agencies have responsibility for land occupied by proposed endangered or threatened plant populations. The owner/manager under whose jurisdiction the majority of the known populations occurs is listed first.

Under REMARKS the distribution and relative abundance of species populations and the length of time since the species was last collected or observed are discussed where appropriate.

The LITERATURE CITED section includes all citations not in the ORIGINAL DESCRIPTION section at the beginning of each narrative.

A glossary was included for technical terms in the text. Definitions were abstracted from Harrington and Durrell (1957) and Kearney and Peebles (1960).

The original booklet was compiled with the assistance of Dr. Dieter Wilken, Curator of the Herbarium, Colorado State University; Dr. William A. Weber, Curator of the Herbarium, University of Colorado Museum; James Ratzloff, Bureau of Land Management, Montrose District; Dr. Charles Feddema, Curator of the Forest Service Herbarium, Fort Collins; and Dr. Janet Hohn, now Botanist with the U.S. Fish and Wildlife Service, Portland, Oregon.

This booklet, as originally prepared by Ecology Consultants, Fort Collins, and published by U. S. Fish and Wildlife Service, Lakewood, contained descriptions, discussion, drawings and photographs, and maps of the proposed endangered and threatened plant species of Colorado. The booklet was drafted in March 1978, although it was not distributed until July 1978.

The field season of 1978 was an exceptionally productive one. The U. S. Forest Service (Rocky Mountain Region), currently the only Federal agency conducting field studies of proposed plant species on all of its lands in Colorado, has also been conducting field studies in parts of Wyoming and literature-herbarium studies in parts of South Dakota, Nebraska and Kansas. Other agencies, most notably the Bureau of Land Management (Montrose District), State of Wyoming (Department of Environmental Quality), and State of Colorado (Natural Areas Program), have also had field programs. Many field botanists have made special trips to study rare plant species in the field, including William A. Weber, Dieter Wilken, William Harmon, Robert D. Dorn, and James Ratzloff.

Results of these studies (that seem to grow in intensity and scope each year) have been: several species new to the region and a few species new to science have been discovered, and (most notably this year) several species lost for many years have been rediscovered. In addition, the known ranges of many species have been extended by field searches.

The systematic study of candidate or proposed endangered and threatened plant species has six major foundations:

1. Recommendations. The Federal Lists are only a beginning (because of their limited accuracy and information content). To them must be added the lists of State and local studies, whether private or government. Contact must be maintained with all government agencies doing studies on proposed plant species, the botanical-taxonomic community throughout the region, informed range management and land management personnel throughout the region, and interested local people. Every recommended species must

be followed through (at least) herbarium and literature searches to determine approximate range and whether the species appears to merit further consideration. The species cannot be accepted or rejected by sole reliance on the personal opinion of any person (no matter how famous); data must be presented to support any conclusion.

2. Floristic Studies. The entire flora of the region must be studied with the aim of identifying species of limited range that might be possible candidates for study. This will include rare endemics (plant species that only grow in this region), which might become candidates for the Federal Endangered Species Act; it should also include rare disjuncts (plant species with few populations here but with ranges elsewhere in the world and a large gap between) which might become candidates for the various State and local programs that are evolving at a steadily increasing rate. The species in this last category, rare disjuncts, are not included in this publication.

3. Literature. Reference must be made to all floras, major and minor, present and past. The original description should be copied, and nomenclatural synonyms and history traced. Monographic/revisionary treatments should all be copied. Other literature dealing with the species' distribution or nomenclature should be accumulated; this is necessarily a continuing process.

4. Herbarium. Visits must be made to large regional herbaria, large national herbaria in other regions, the herbaria of small colleges and universities, and other laboratories and institutes. At each, locality data should be extracted in full and color photographs taken of key specimens (especially of the species for which field photographs are unavailable). Each specimen should be carefully examined (following good herbarium practice) to ascertain its correct identification since specimens of rare species are sometimes misidentified, especially in small herbaria. While at an herbarium, opportunity should be found to consult the library and talk with the curator or assistant about field localities, nomenclature, identification, and his/her recommendations for additional species to be studied. Herbarium searches for the reasons mentioned above should be performed by qualified professional botanists.

5. Field Studies.

   a. Searches. To be conducted (ideally) over as large an area as possible, but practically limited to the

expected habitat's range. The first step is to visit at least one population; second, to accurately and completely describe the species' habitat (to include ecological relations, vegetation type, associated species, aspect, slope, altitudinal range, soil type and geology, etc.); third, to discover all populations (both previously reported and also newly discovered ones). The general goal is to determine the factors limiting the species' distribution; a good test of having so done is to say, "It will grow over there," or, "It will not be found over there," and have your hypothesis confirmed by a visit to the predicted site.

b. Population Studies. To include all your observations about the species' habitat (as detailed as possible), exact legal and verbal locality descriptions, number of populations and their sizes (both in number of individuals and in area covered). In addition, careful observations should be made about the population's health and the influence of any possible endangering factors that may be present. This must include negative observations about which factors are not present or not important as well as positive observations about which factors are important. If possible, the populations should be revisited at a later date or in another year and measurements taken to estimate population trend.

6. Reporting of Results.

a. Visit to person or agency having direct management responsibility for the land in question.

b. Liaison with other agencies doing field, literature or herbarium studies, both to add to your own data and to supplement theirs.

c. Reports to your own agency or organization.

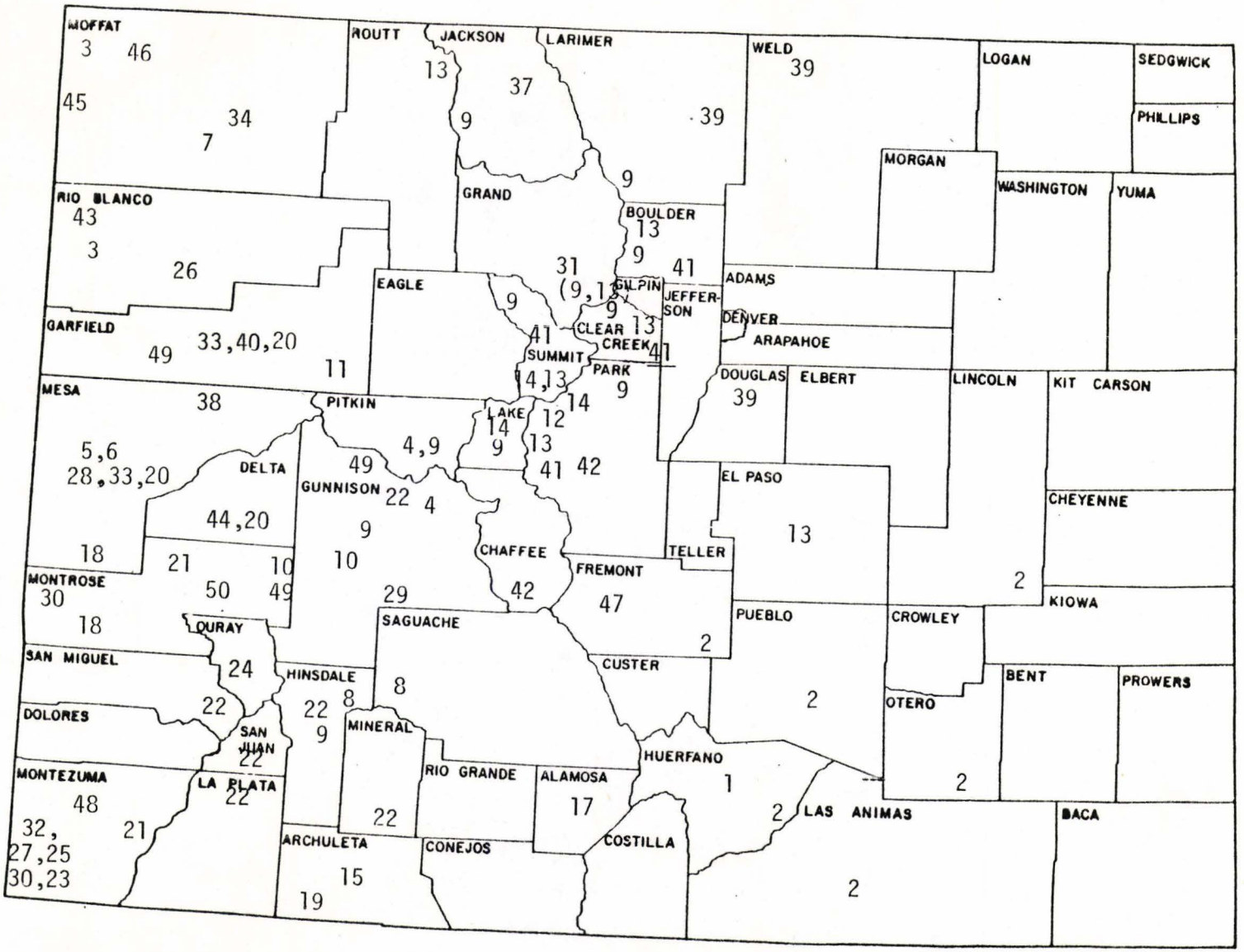
d. Reports to the U.S. Fish and Wildlife Service, the official administrators of the Endangered Species Act of 1973.

Additions and modifications were prepared by Barry C. Johnston, Botanist, USDA, Forest Service, Rocky Mountain Region, Lakewood, Colorado.

II. COLORADO, WYOMING, SOUTH DAKOTA, NEBRASKA, AND KANSAS PROPOSED AND SUGGESTED ENDANGERED AND THREATENED PLANT SPECIES

1. COLORADO PROPOSED SPECIES

VII. MAP OF PROPOSED THREATENED AND ENDANGERED PLANT SPECIES



VIII. SPECIES ACCOUNTS

APIACEAE (UMBELLIFERAE)

SCIENTIFIC NAME: Neoparrya lithophila Mathias

ORIGINAL DESCRIPTION: Mathias, Ann. Mo. Bot. Gard. 16:393-394. 1929.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Huerfano County, vicinity Farisita; T 27S, R 69W.

HABITAT: Occurring in cracks and shelves of cliffs associated with a volcanic dike; 7000 feet.

DESCRIPTION: Herbaceous perennial appearing stemless due to crowded basal leaves. Singly pinnate basal leaves and reflexed umbel rays are diagnostic characters. Linear leaflets 5-20 mm long. Flowering stems exceed basal leaves. Fruit oblong, glabrous, 3-5 mm long, lacks stylopodium, but with inconspicuous dorsal ribs. Flowering: June, July; Fruit: late July, early August (Mathias 1929).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Private land

REMARKS: Unique population, not found on other volcanic dikes in the vicinity of the type locality.

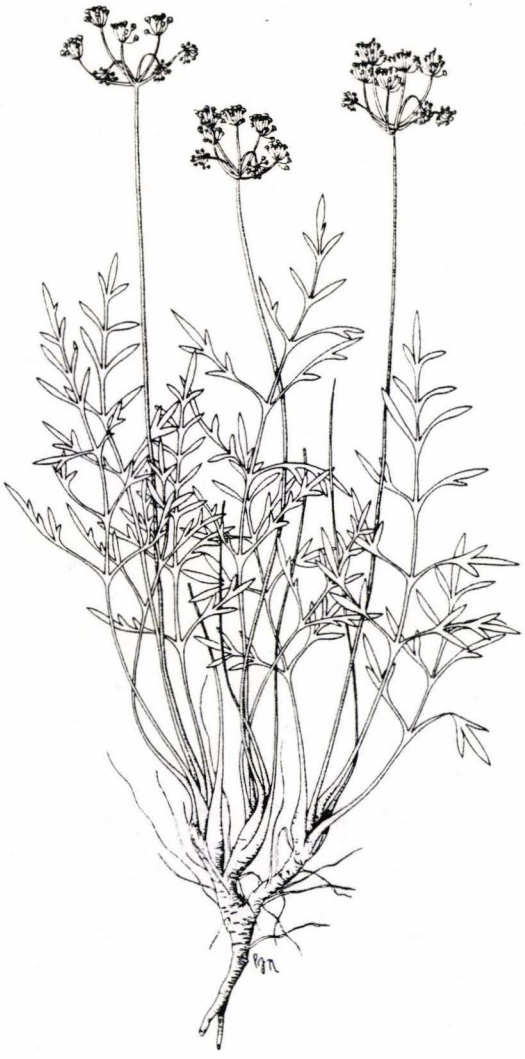
Additional Comments on Neoparrya lithophila:

This species may be distinguished from other Umbels by its lack of a true stem, thick fleshy singly-pinnate leaves, and reflexed umbel rays. A more reliable character is not visible in the field and has to do with the oil tubes in the fruit. The fruit is usually not flattened at all, and most of the ribs are more or less equal and without wings.

The line drawing depicts basal leaves somewhat sheathing up the stems, which is inaccurate; it also shows some of the umbel rays curved, which never happens. The diagnostic character, "reflexed umbel rays," means that some of those rays are pointed straight (not curved) downward, thus giving to the inflorescence a ball-shaped appearance not accurately shown in the drawing.

This species is still known from only one small to medium sized unique population; former reports of this species from New Mexico are in error (see article by W. A. Weber, Rhodora 60:265-271 (1958) for discussion).

No endangering or threatening Factors have been noted at this population, but it is small to medium sized (about 50 individuals), growing in a very limited area, and so would be very easily eradicated.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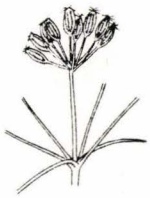
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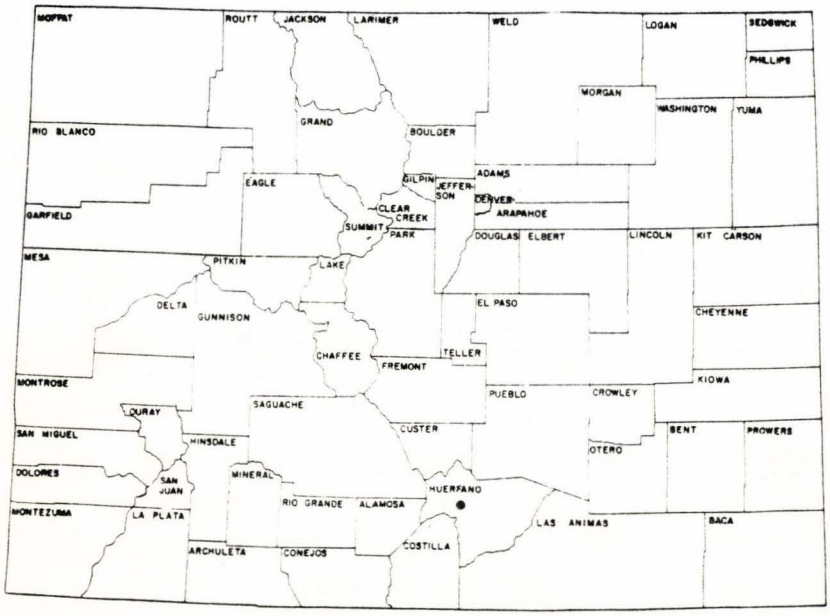
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GILPIN
JEFFERSON
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GARFIELD
SUMMIT
PARK
DOUGLAS
ELBERT
LINCOLN
KIT CARSON
MESA
PITKIN
LAKE
DELTA
GUNNISON
EL PASO
CHEYENNE
CHAFFEE
TELLER
FREMONT
MONTROSE
KIOWA
PUEBLO
CROWLEY
OURAY
SAGUACHE
SAN MIGUEL
HINSDALE
CUSTER
BENT
PROWERS
OTERO
DOLORES
SAN JUAN
MINERAL
HUERFANO
MONTEZUMA
LA PLATA
RIO GRANDE
ALAMOSA
LAS ANIMAS
BACA
ARCHULETA
CONEJOS
COSTILLA

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: Haplopappus fremontii ssp. monocephalus (A. Nels.) Hall [Oonopsis foliosa (Gray) Greene]

ORIGINAL DESCRIPTION: Hall, Harvey M. "The Genus Haplopappus: A Phylogenetic Study in the Compositae." 1928. 391 pp.

COMMON NAME(S): Goldenweed

KNOWN DISTRIBUTION: Las Animas, Huerfano, Pueblo, Lincoln, Fremont and Otero Counties. Representative location: T 17S, R 53W.

HABITAT: Plains and hills, 5500 - 6000 feet.

DESCRIPTION: Herbaceous perennial, 15-30 cm tall, stems arising from a woody caudex. Leaves usually oblong-lanceolate, entire, 5-10 cm long, 5-15 mm wide. Diagnostic characteristic is lack of ray flowers, and imbricated long, sharp, pointed (about 18 mm long) involucral bracts. Usually one flower head per stem (hence the name monocephalus), disk flowers yellow (Harrington 1964). Flowers in June, July.

TAXONOMIC PROBLEMS: Possibly a genetic deviant, but not well studied (Wilken, personal communication).

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown, probably private

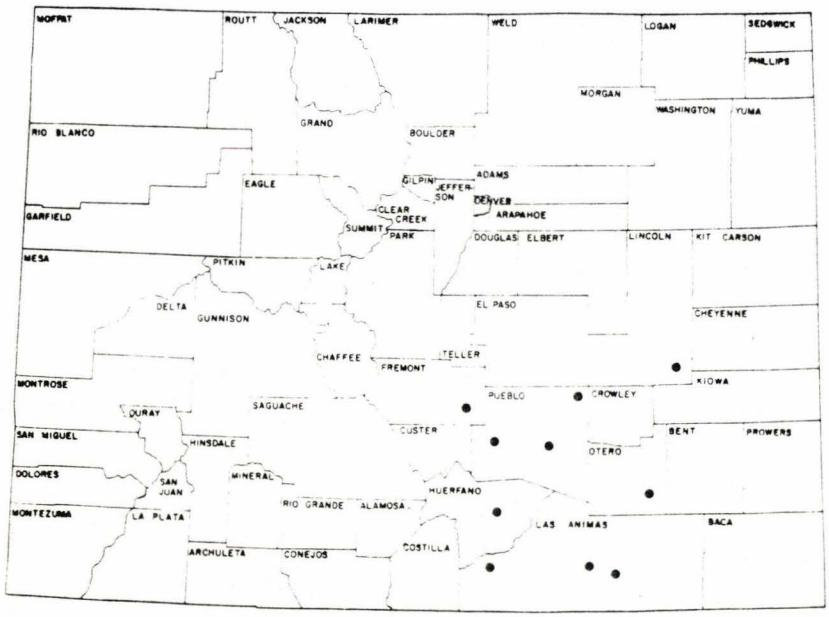
REMARKS: Appears to be widespread in southeastern Colorado, possibly ranging into New Mexico.

Additional Comments on Haplopappus fremontii ssp. monocephalus:

This species should be placed in the genus Oonopsis and probably should appear as a variety of O. foliosa, but so far as is known, no one has formally proposed such a variety. This variety differs from typical O. foliosa in its heads without ray-flowers, usually solitary on the stems, with involucral bracts about 18 mm long. The whole species Oonopsis foliosa has the distribution as shown on the map on page 13; the variety monocephalus has been seen only once, in western Las Animas County, Colorado.

The line drawing is accurate and should enable a person to accurately identify this variety.

1 cm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ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: Parthenium ligulatum (Jones) Barneby

ORIGINAL DESCRIPTION: As Parthenium alpinum var. ligulatum Jones, Contr. W. Bot. 13:16, 1910; Barneby, Leafl West. Bot. 5:20. 1947.

COMMON NAME(S): Feverfew

KNOWN DISTRIBUTION: Rio Blanco, Moffat Counties, also in adjacent Utah (Duchesne County). Representative locality: T 11N, R 103W.

HABITAT: White gypseous shale bluffs, associated with species that occur only on soils rich in selenium. Stanleya, Astragalus racemosus, A. detritalis (a proposed endangered species) occur with P. ligulatum near Duchesne, Utah; 5400-5750 feet.

DESCRIPTION: Herbaceous perennial plants; 2-5 cm tall. Leaves all basal, and crowded on a caudex. Flowers rayless, disk flowers perfect but sterile except for a few marginal flowers. Chaff of the receptacles pubescent at the tip and the pappus consists of two thick teeth extending from the edge of the wingless achene. P. ligulatum is similar to P. tetraneuris and P. alpinum, but has strap-shaped pistillate florets, sessile heads (almost hidden among the leaves), and thicker, broadly spatulate, yellowish-green leaves (Barneby 1947). Flowering: early spring (April); Fruit: mid-June.

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Some populations possibly damaged by motorcyclists using shale hills and basins.

LAND OWNERSHIP/MANAGEMENT: BLM, private

REMARKS: None

Additional Comments on Bolophyta ligulata (Parthenium ligulatum):

The text on page 14 is correct and complete except for an additional remark that Utah botanists are currently recommending that this species be dropped because of its relative abundance in Utah.

The line drawing on page 15 is inaccurate and misleading. As three species of Bolophyta are very similar in their habits and appearances, a photograph of B. tetraneuris is shown on page 14C. The reader may assume that the other two species, B. ligulatum and B. alpina are very similar but differing in the characters mentioned below.

SCIENTIFIC NAME: Bolophyta alpina Nuttall

ORIGINAL DESCRIPTION: Nuttall, Trans. Amer. Phil. Soc. N.S. 7:347 (1840). Transferred to Parthenium by Torrey & Gray, Flora North Amer. 2:285 (1840). Also described by Rollins, Contrib. Gray Herb. 172:66-70 (1950).

COMMON NAMES: None

KNOWN DISTRIBUTION: Southeastern Wyoming, in Natrona, Carbon, Niobrara and Platte Counties, also in adjacent northern Weld County, Colorado.

HABITAT: Forming low mats on barren clay hills and slopes, the soil usually alkaline and derived from formations of mudstone or shale, 5000-6400 ft. This species, originally collected and described by Nuttall in the first part of the 19th century, was then lost for over 100 years; for a remarkable pre-rediscovery discussion of habitat, see Barneby in Leaflets West. Bot. 5:18-21 (1947).

DESCRIPTION: Low, matted, perennial plant that extends very little above ground level, at most 4 cm, from a thick, branched root. The leaves are entire, strap-shaped with rounded tips, bluish-green colored. On each root-branch is borne a tuft of leaves at ground level and sometimes a single head on very short peduncles. The heads are 5-10 mm wide, with greenish flowers, but no ray-flowers are evident. Flowers from late April through May, fruit shortly after flowering.

TAXONOMIC PROBLEMS: As mentioned above, these three species of Bolophyta are similar to one another and very dissimilar to species of Parthenium. These three species, while being very closely related, are consistently different from one another; B. alpina differs in having no ray-flowers and very short peduncles.

EXISTING OR POTENTIAL THREATS: None known. Although this species was not rediscovered until 1948, since that time eight or more localities have been discovered and more localities will probably follow. These are unusual plants, but they are becoming better known; many of the 8-10 known populations have 500 or more individuals each.

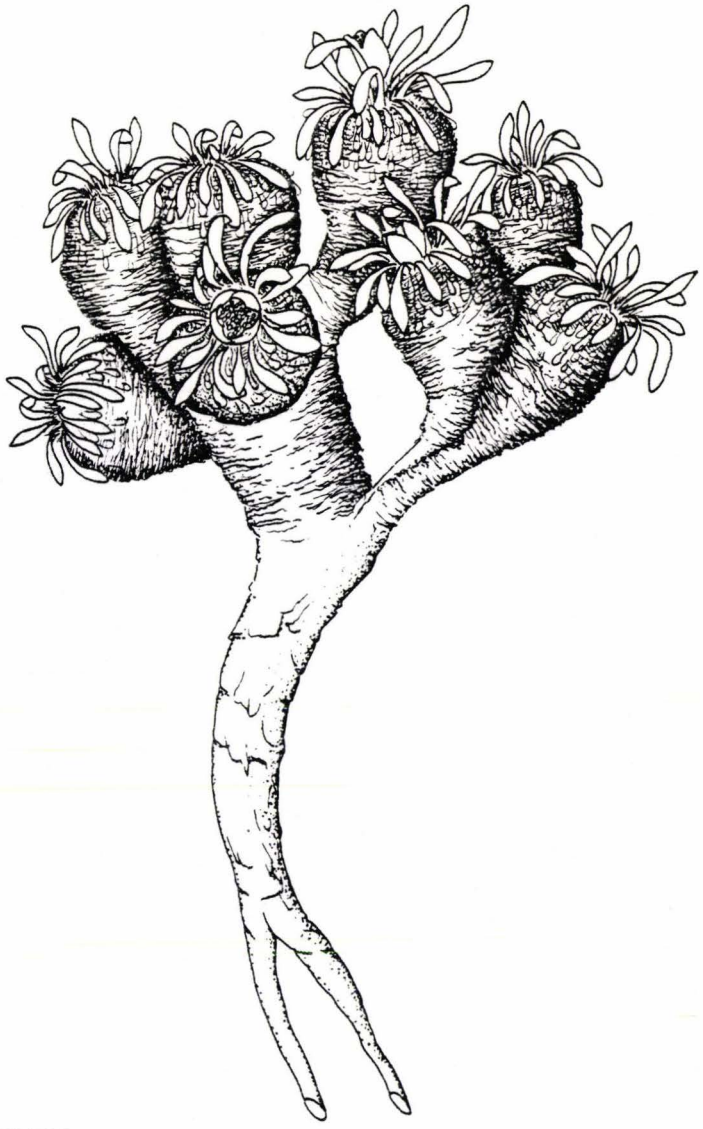
LAND OWNERSHIP/MANAGEMENT: Private; Bureau of Land Management; Pawnee National Grassland.

REMARKS: This species has appeared on several Wyoming lists.

SCIENTIFIC NAME:	Bolophyta tetraneuris (Barneby) W. A. Weber.
ORIGINAL DESCRIPTION:	Barneby, Leaflets West. Bot. 5:19-20 (1947). Also described by Rollins, Contrib. Gray Herb. 172:69 (1950).
COMMON NAMES:	None
KNOWN DISTRIBUTION:	Arkansas River Valley in eastern Fremont County, Colorado, and in adjacent western Pueblo County, Colorado; also reported from southwestern El Paso County, Colorado.
HABITAT:	Forming low mats on barren clay hills and slopes, in clearings in Piñon-Juniper forests, the soil usually alkaline and derived from light-colored shale, 5200-5600 ft.
DESCRIPTION:	Very similar to B. alpina and B. ligulatum, but with no ray-flowers, heads on short but evident peduncles 1-3 cm long, and the leaves with three evident nerves on their upper surfaces. The leaves are usually broader than in B. alpina to which it is most closely related. Flowers from early to late May, fruit shortly afterward.
TAXONOMIC PROBLEMS:	Discussed above. This species has also been described as a variety of B. alpina.
EXISTING OR POTENTIAL THREATS:	The original (type) specimens were collected on a hill very close to an active limestone processing mill; in the past, this hill has apparently been mined, evidently depleting the population of this species somewhat, but the population there appears fairly healthy now, and the mining of this hill has not continued in recent years. Other populations seen have no evident Threats on the sites; however, at one of the other populations, recreational off-road motorcycles have disturbed the substrate near the site but not within the population of this species.
LAND OWNERSHIP/ MANAGEMENT:	Private; Bureau of Land Management; possibly also Fort Carson Military Reservation.
REMARKS:	Known from about five populations with about 300 total individuals. It is very possible that more populations will be discovered. This species was recommended as Endangered by Smithsonian (1978) and also appears on the Colorado Native Plant Society's "Working List" (1978).

Bolophyta tetraneuris
U.S.D.A. Forest Service

Photo from U.S.D.A. Forest Service, Region 2 Library



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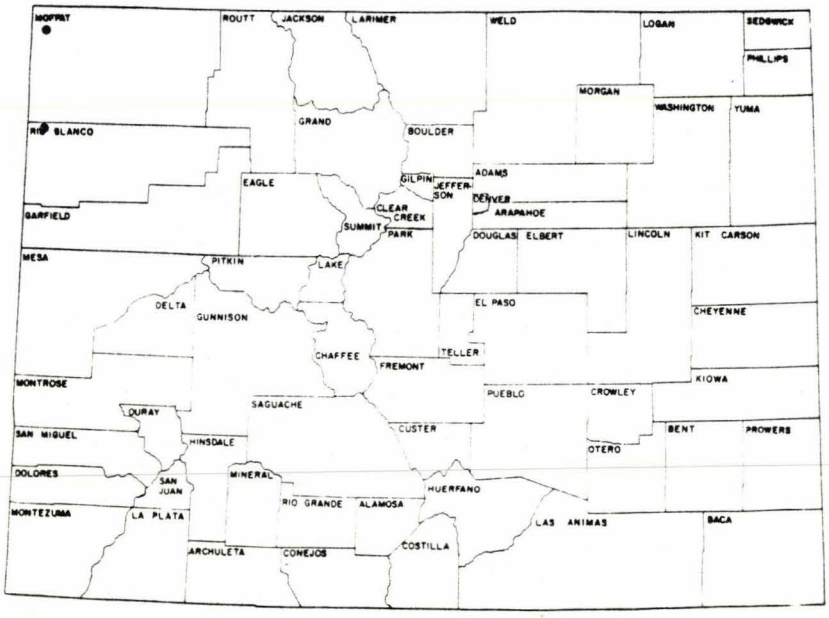
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ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: Senecio porteri (Greene)

ORIGINAL DESCRIPTION: Greene, Pittonia 3:186. 1897.

COMMON NAME(S): Porter groundsel

KNOWN DISTRIBUTION: Gunnison and Pitkin Counties, alpine areas in the Elk Mountains. Representative locality: T 12S, R 85W.

HABITAT: Boulder fields, gravelly slopes in association with Ligularia holmii; 12,000 feet.

DESCRIPTION: Herbaceous perennial alpine plant, 1-10 cm tall. Leaves basal, purplish-tinged, 8-15 mm long, usually reniform (kidney-shaped) but sometimes broadly ovate, with serrated edges. Flower heads solitary, ray flowers yellow (Ratzloff 1977).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: One of four known populations depleted by seepage from old mine tailings (Johnston, personal communication).

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service

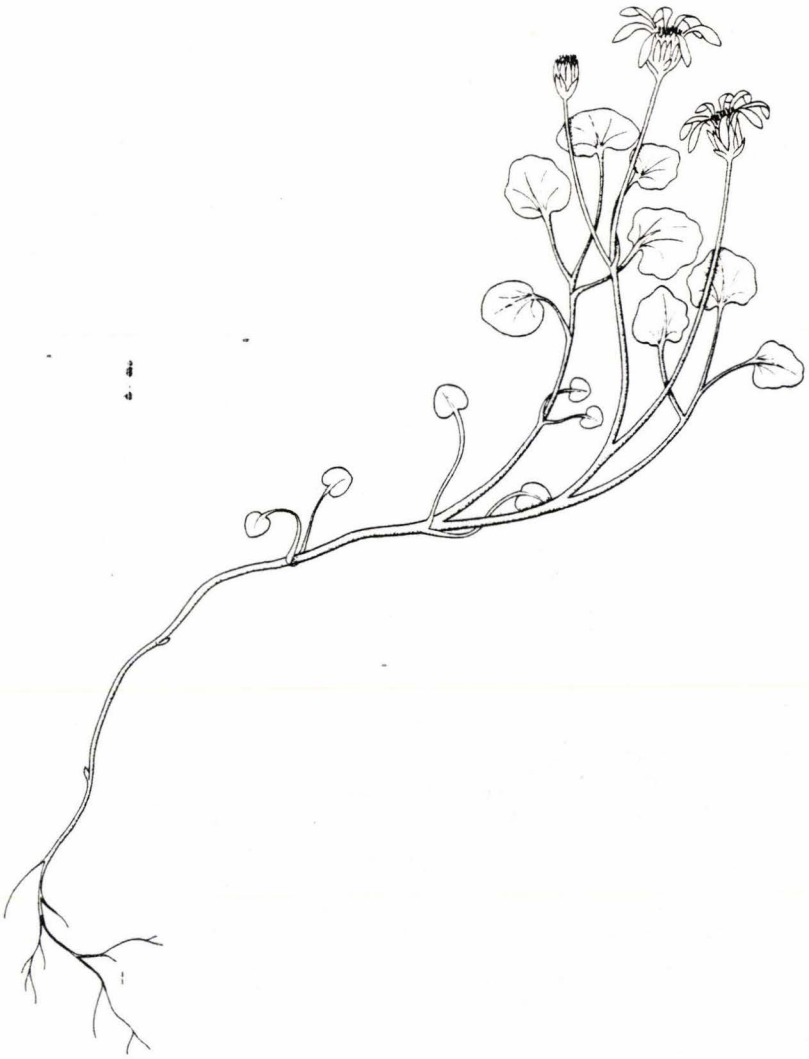
REMARKS: Appears to occupy a very restricted range, populations small to moderate in size (Johnston, personal communication).

Additional Comments on Senecio porteri:

The proper name for this species is Senecio porteri Greene (without the parentheses). This name was first published by Greene in Pittonia 3:186 (1897) but no description was given by him; he referred back to the description of Senecio renifolius Porter, published in Porter and Coulter, Flora of Colorado 83 (1874). Greene did this because the name Senecio renifolius had already been used for another plant before Porter.

There have been four populations of this species discovered this season; it is very possible that more will be discovered in the future. The species is now known from Gunnison, Pitkin, Hinsdale and Ouray Counties, Colorado; there are eight or nine populations now known. The populations appeared much larger during 1978 than they had appeared after the 1977 field season, presumably because of the radical difference in moisture availability between those two seasons. Several of the known populations had 5000+ individuals in the 1978 season; it is estimated that there may be more than 30,000 individuals of this species in existence.

Land Ownership/Management: Gunnison National Forest (Taylor River Ranger District), White River National Forest (Aspen and Sopris Ranger Districts); and Bureau of Land Management (Montrose District).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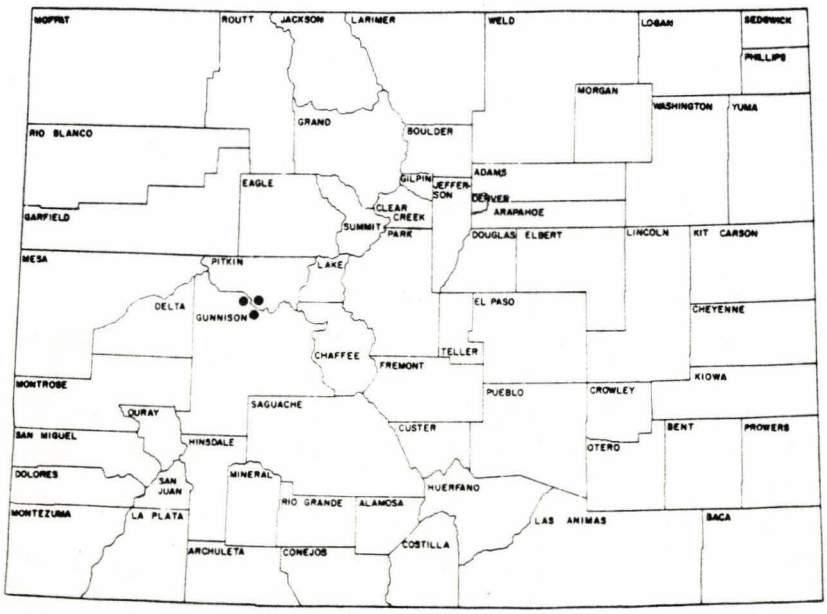
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BORAGINACEAE

SCIENTIFIC NAME: Cryptantha aperta (Eastw.) Payson

ORIGINAL DESCRIPTION: (As Oreocarya aperta) Eastwood, Bull. Torr. Bot. Club 30:241. 1903; Payson, Ann. Missouri Bot. Gard. 14:295. 1927.

COMMON NAME(S): Catseye.

KNOWN DISTRIBUTION: Mesa County, vicinity of Grand Junction.

HABITAT: Upper Sonoran Zone, on dry ground. 4500 feet.

DESCRIPTION: Herbaceous perennial, several stems 10-20 cm tall ascending from a caudex. Leaves mostly basal, spatulate or oblanceolate. Pubescence of upper and lower leaf surfaces consisting of sparse, short, stiff appressed hairs and pustulate hairs. Flowers white, occurring in aggregated or spreading spikes branching from the base of the inflorescence. Corolla tube 2.5-3 mm long (equalling or shorter than the sepals). Mature nutlets lanceolate acute, 2.5-3 mm long, roughened on the inside and outer surfaces, scars closed (Payson 1927). Flowering: May; Fruit: June.

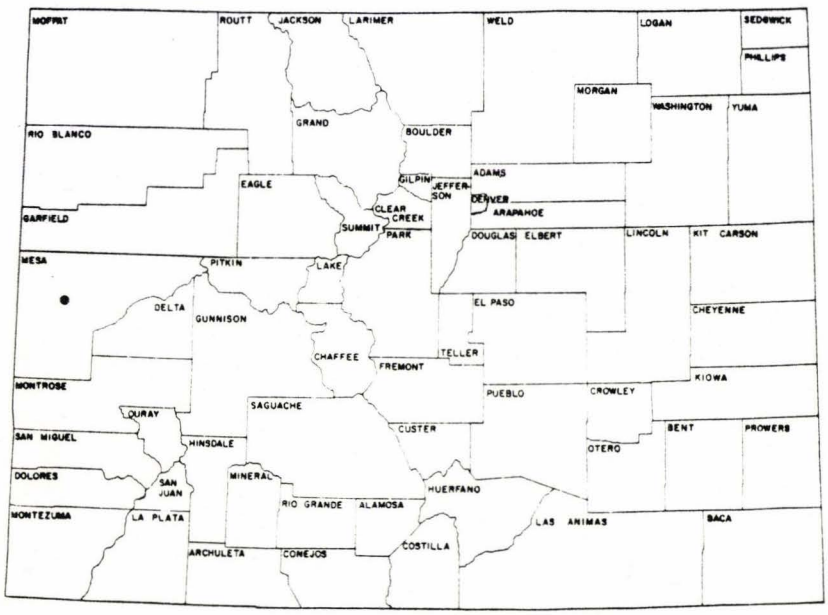
TAXONOMIC PROBLEMS: Unknown

EXISTING OR POTENTIAL THREATS: None known

LAND OWNERSHIP/MANAGEMENT: Unknown

REMARKS: This species has not been collected since 1892, and the type locality may have been eliminated by agricultural and urban development in the vicinity of Grand Junction.

No Illustration Available



BORAGINACEAE

SCIENTIFIC NAME: Cryptantha elata (Eastw.) Payson

ORIGINAL DESCRIPTION: Eastwood, Bull. Torr. Bot. Club 30:241. 1903; Payson, Ann. Missouri Bot. Gard. 14:285. 1927.

COMMON NAME(S): Catseye, Cliffdweller's candlestick

KNOWN DISTRIBUTION: Mesa County, Colorado River valley in the vicinity of Grand Junction. Representative locality: T 10S, R 101W.

HABITAT: Barren clay hills, Upper Sonoran Zone. 4500-6000 feet. Dry, shifting, or disturbed soil.

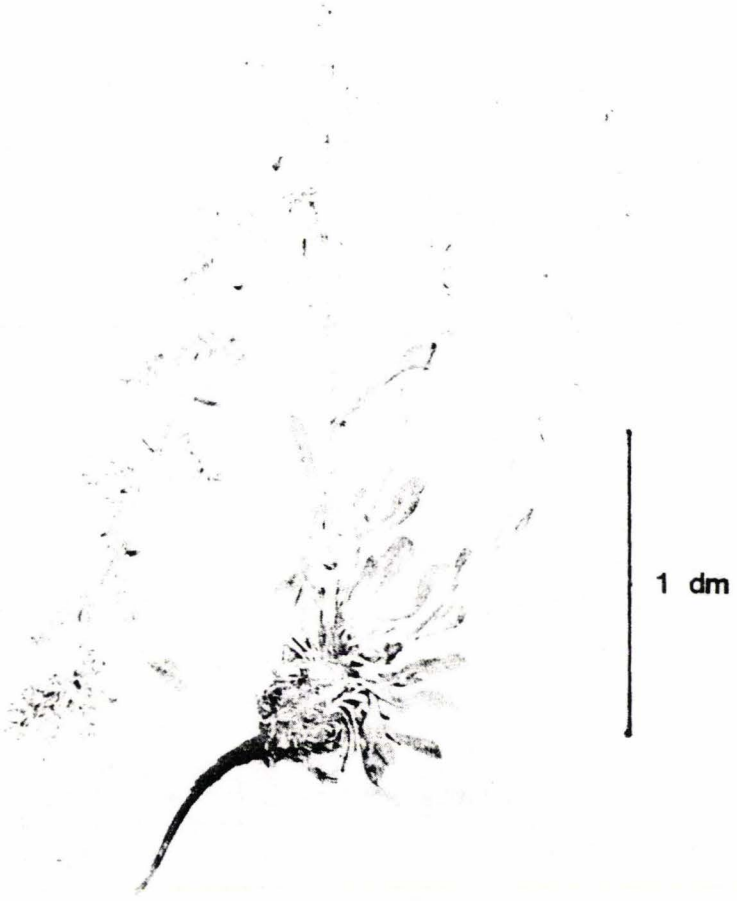
DESCRIPTION: Herbaceous perennial, stems stout, one to several, 30-50 cm tall. Stems covered by stiff, bristle-like appressed hairs. Basal leaves spatulate, 1.5-3 cm long, stem leaves linear oblanceolate, acute, 2-4 cm long; hairy. Inflorescence extending over upper 1/3 or 1/2 of the stem, broad at the top, tapering at base. Flowers (corolla) white, 4 mm long, equal in length to the sepals. Nutlets about 5 mm long, surface slightly glossy, densely bumpy (tuberculate) and wrinkled. Scar extends from near the base to the apex, straight, closed except at the base where scar is forked and slightly open. Flowering: mid-May; Fruit: late June (Payson 1927).

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM, private

REMARKS: Occurs in adjacent Utah.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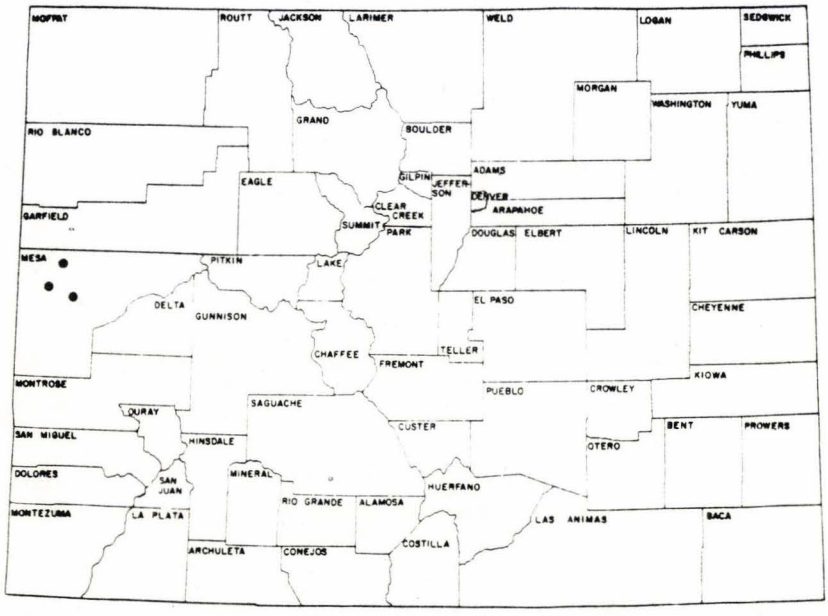
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BORAGINACEAE

SCIENTIFIC NAME: Cryptantha stricta (Osterhout) Payson

ORIGINAL DESCRIPTION: As Oreocarya stricta Osterhout, Bull. Torrey Bot. Club. 50:217. 1923; Payson, Ann. Mo. Bot. Gard. 14:295. 1927.

COMMON NAME(S): Catseye

KNOWN DISTRIBUTION: Moffat County, south of the Yampa River, Dinosaur National Monument. Representative locality: T 6N, R 103W. Also known from adjacent Utah and Wyoming.

HABITAT: Clay soils, 5000-8500 feet.

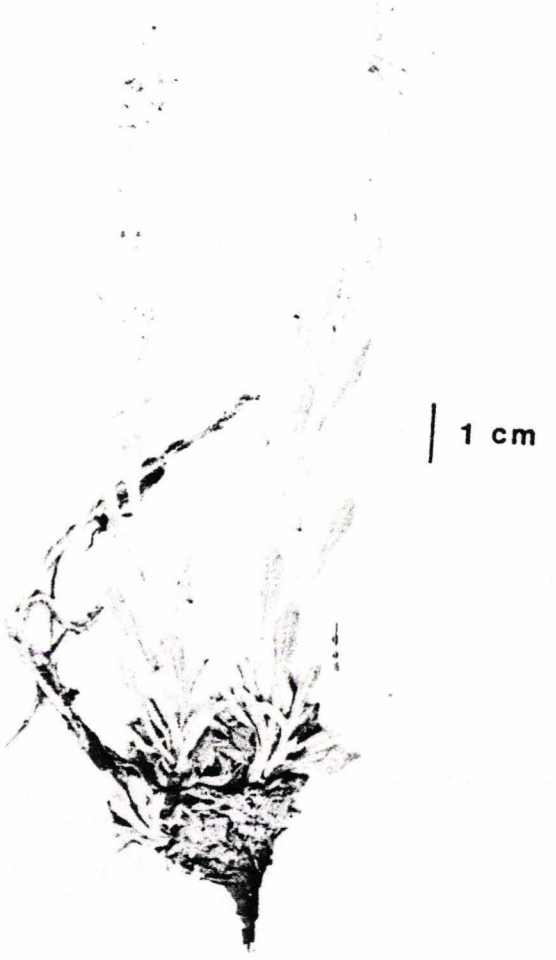
DESCRIPTION: Herbaceous perennial consisting of 1-3 erect stems (1.5-3 cm high). Stems with strong, divaricate bristles and sparsely retrorse-strigose hairs. Leaves mostly basal, oblanceolate, 2-5 cm long, with spreading bristles and strigose pustulate hairs about equally numerous on both leaf surfaces. Upper leaves similar, but reduced in number. Narrow crowded inflorescence consists of white or possibly yellow flowers. Petals equal or shorter (3.5 mm) than the sepals. Surfaces of nutlets glossy, dorsal surface roughened, inner surface smooth; scar nearly closed and straight (Payson 1927). Flowering and fruit: late June, early July.

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM, National Park Service, Private.

REMARKS: None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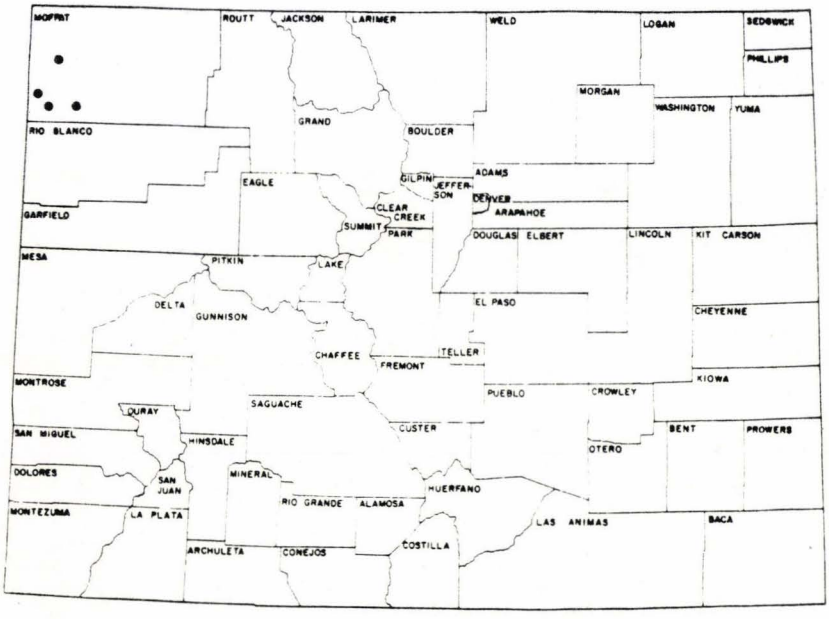
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BORAGINACEAE

SCIENTIFIC NAME: Cryptantha weberi I.M. Johnston

ORIGINAL DESCRIPTION: Johnston, Journ. Arn. Arb. 33:72. 1952.

COMMON NAME(S): Weber's catseye

KNOWN DISTRIBUTION: Saguache and Hinsdale Counties, 9700-10,000 feet. Representative locations: T 45N, R 3E; T 45N, R 2W.

HABITAT: Volcanic ash deposits in association with Aster coloradoensis, Senecio hallii, and Penstemon secundiflorus. On dry slopes among rubble, shelves of cliffs.

DESCRIPTION: Herbaceous perennial, weak stems branching from the base. Stems 20-60 cm tall. Leaves narrow, oblanceolate (3-10 cm long), beset with long sharp rigid bristles on both surfaces. Flowers white, conspicuous bracts extending beyond groups of flowers (cymes). Corolla tube 3-4 mm long. Nutlets small (less than 2.5 mm long) with open scars, roughened outer surfaces and smoother inner surfaces. This species differs from Cryptantha virgata by its branching habit, and smaller nutlets (Johnston 1952). Flowering: late June, early July; Fruit: late July.

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM, private, U.S. Forest Service.

REMARKS: Apparently restricted by edaphic (soil) factors. Locally abundant at two sites, scattered elsewhere (Johnston, personal communication).

Additional Comments on Cryptantha weberi:

This species is now known from 10 or more populations, most of which are medium-sized to large. This is probably one of the better-studied plant species in Colorado, thanks to the efforts of the Rio Grande National Forest, Saguache District.

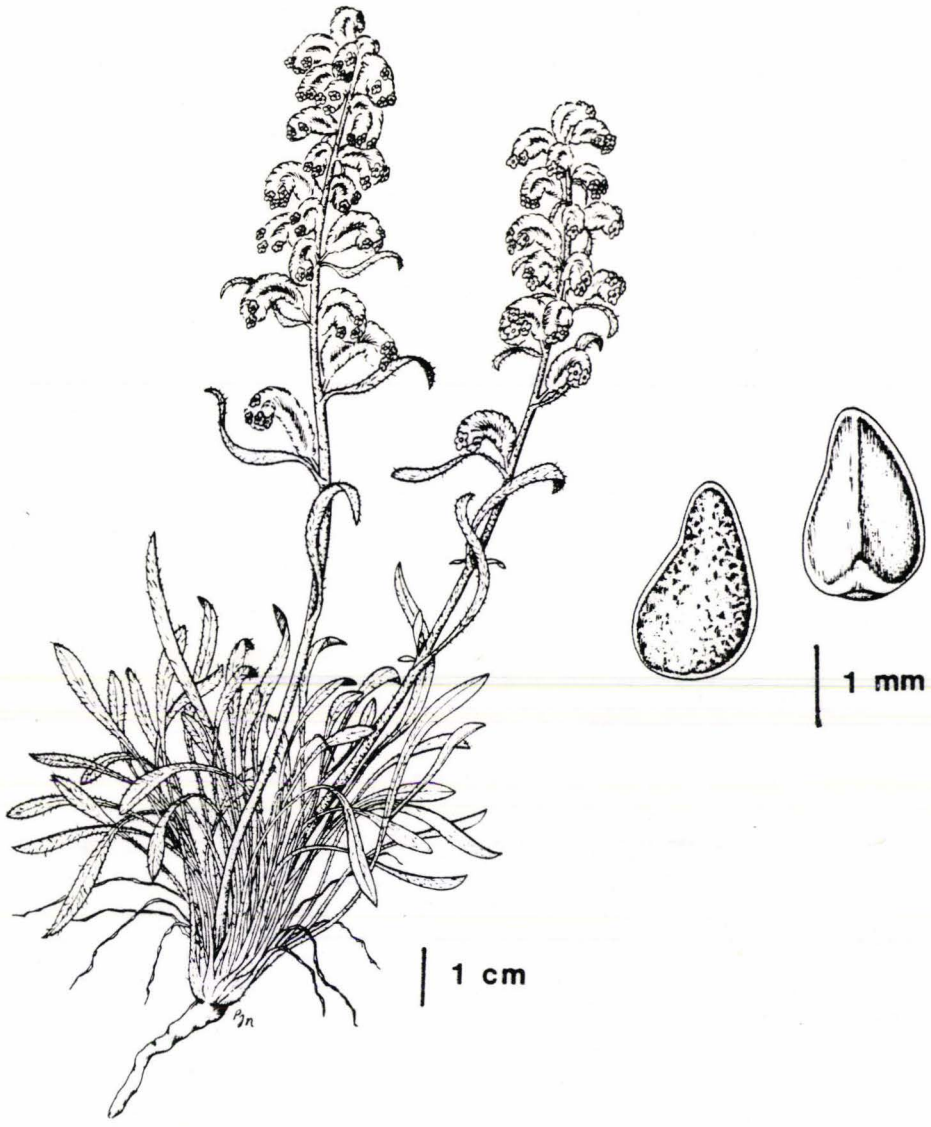
Habitat: Flat barren parks, bare slopes, in crevices of cliffs under protecting rocks, apparently limited to calcareous soil or where alkaline water seeps across cliffs, in a large variety of aspects and slopes, 8800-10,400 ft.

Land Ownership/Management: Bureau of Land Management; private; Gunnison National Forest (Cebolla District); Rio Grande National Forest (Saguache District).

The line drawing on page 25 is inaccurate and misleading, especially with regard to the flowers.

Cryptantha weberi
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library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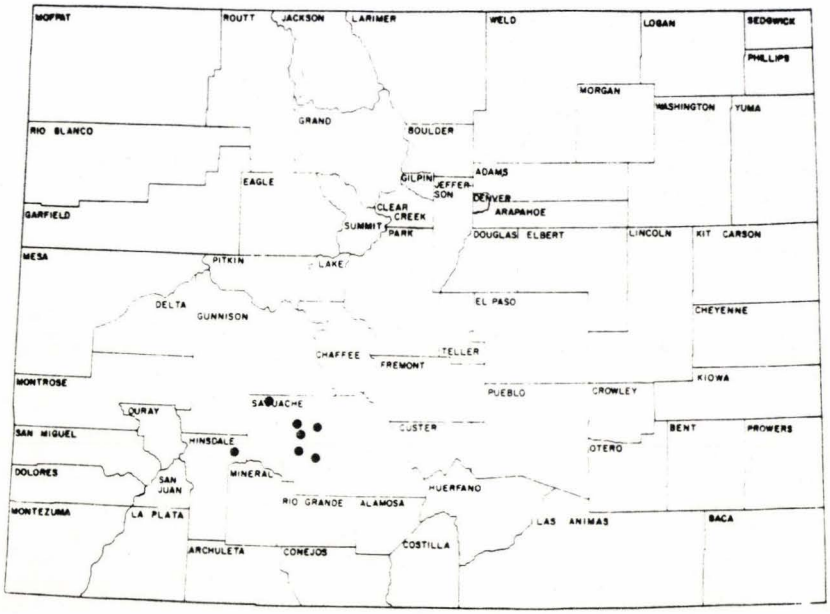
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BORAGINACEAE

SCIENTIFIC NAME: Mertensia viridis var. cana (Rydb.) Williams

ORIGINAL DESCRIPTION: As Mertensia cana Rydberg, Bull. Torrey Bot. Club 36:698. 1909; Williams, Ann. Mo. Bot. Gard. 24:120. 1937.

COMMON NAME(S): Greenleaf bluebells

KNOWN DISTRIBUTION: Scattered localities along Front Range (Larimer County) into central mountains (Summit County). Also reported from Utah.

HABITAT: Meadows in conifer forest, ranging to above treeline (9000-12,000 feet).

DESCRIPTION: Herbaceous perennial, 5-35 cm tall. Basal and upper leaves linear to narrowly ovate, unilateral, with short, stiff gray or white appressed hairs on the upper and lower surfaces. Flowers (corolla) blue, filaments attached near the throat; calyx lobed 2/3 or more of its entire length, tube of calyx longer (3-9 mm) than the limb (Harrington 1964). Flowering: June; Fruit: July.

TAXONOMIC PROBLEMS: The variety cana appears to intergrade extensively with other subspecies of the viridis complex over a wide geographical area, and may not represent a good variety (Wilken, personal communication).

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service, National Park Service, private

REMARKS: This species may be a candidate for removal from the federal list after further study.

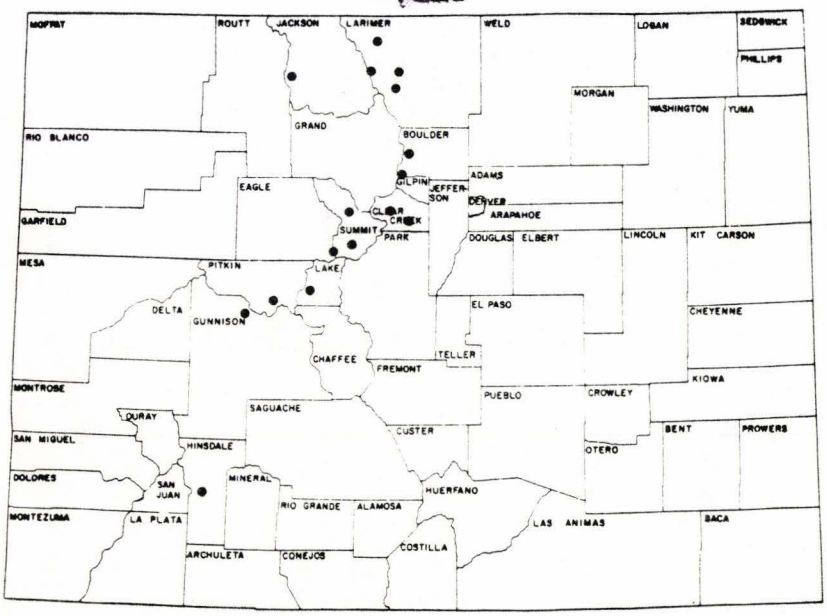
Additional Comments on Mertensia viridis var. cana:

This is not a good taxonomic variety as it occurs throughout the range of the species as individual plants and never forms uniform populations of the type of the variety. The common name, "Greenleaf Bluebell," given on page 26, refers to the whole species.

This "species" should be dropped from the Federal Proposed List.

There are many localities known; the various management agencies and counties have not been indexed.

Mertensia viridis var. cana



BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Arabis gunnisoniana Rollins

ORIGINAL DESCRIPTION: Rollins, Rhodora 43:434. 1941.

COMMON NAME(S): Rockcress

KNOWN DISTRIBUTION: Gunnison and Montrose Counties, vicinity of the Gunnison River. Representative localities: T 49N, R 85W; T 49N, R 84W.

HABITAT: Rocky soil in areas dominated by big sagebrush (Artemisia tridentata).

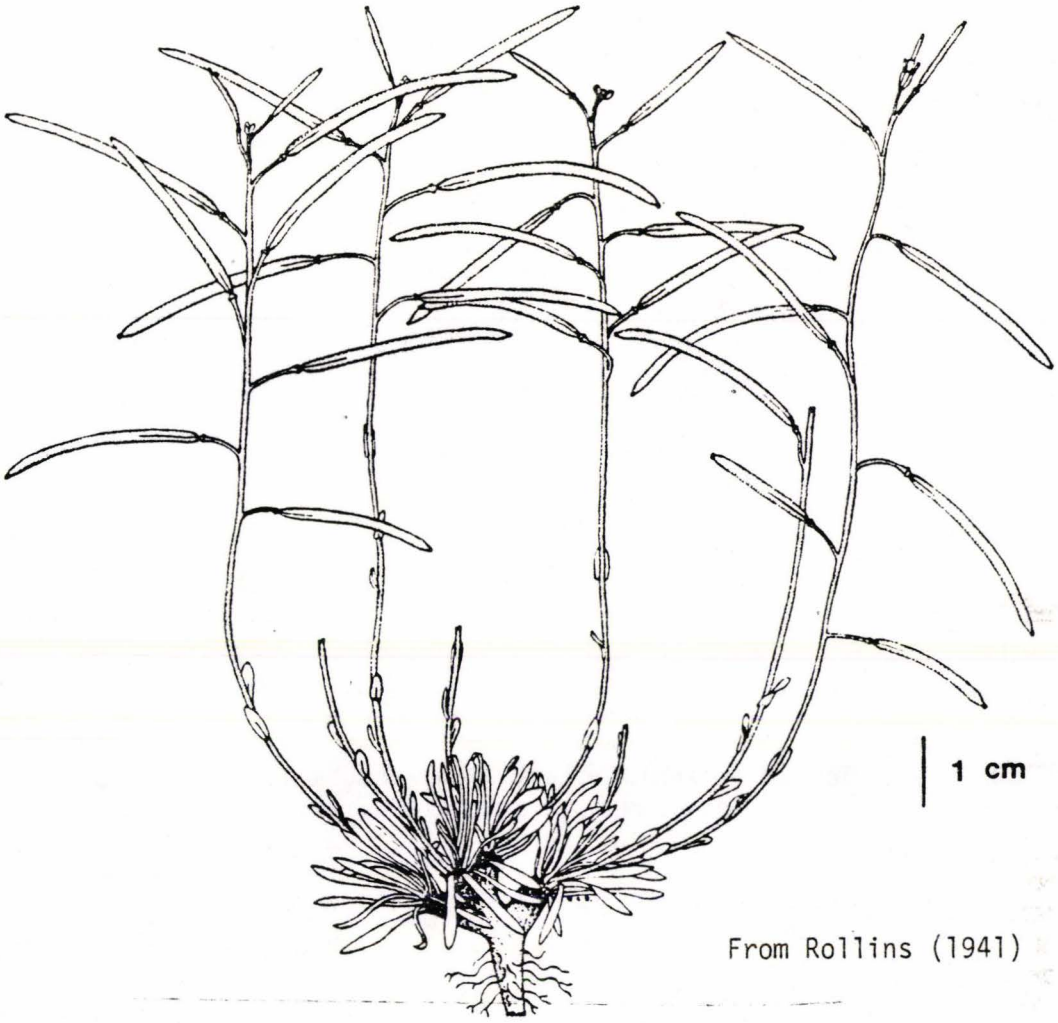
DESCRIPTION: Herbaceous perennial plants, 10-20 cm tall, slender stems arising from a closely branching or simple caudex. Stems densely pubescent below, lacking hairs above. Basal leaves numerous, linear-oblanceolate, acute, entire or rarely few-toothed, 1-2 cm long. Petals pink to purplish, 4-6 mm long and 2 mm wide. Pubescent pedicels spread at right angles to the stem; therefore, flowers and siliques occur perpendicular or slightly recurved to the stem. Siliques not hairy, 2.5-4 cm long and 1-1.5 mm wide, compressed parallel to the septum at maturity (Rollins 1941). Flowering: April; Fruit, May, June.

TAXONOMIC PROBLEMS: Part of the Arabis demissa complex needs further study to clarify relationship with other members of the complex (Johnston, personal communication).

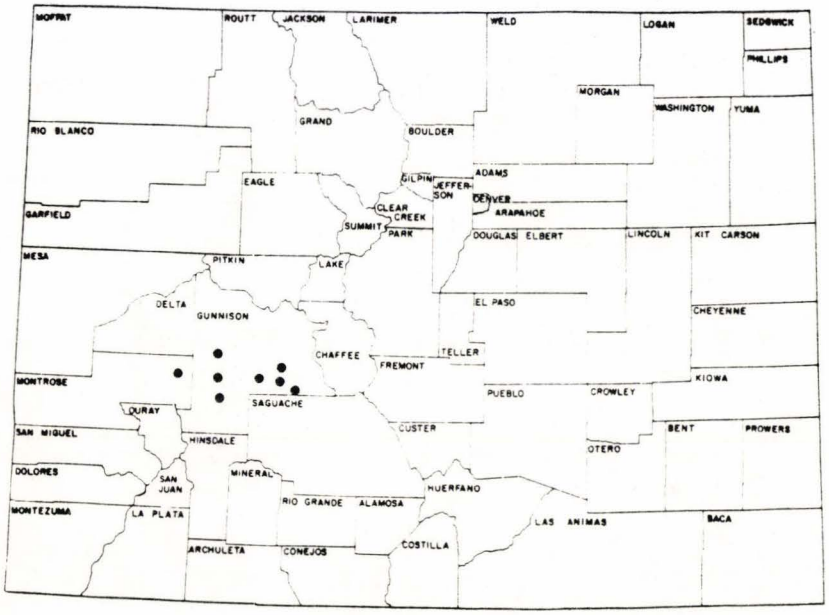
EXISTING OR POTENTIAL THREATS: Species not recently found in localities where previously known; factors responsible for disappearance not known (Johnston, personal communication).

LAND OWNERSHIP/MANAGEMENT: BLM, private

REMARKS: Appears to be highly restricted in its range, and not common where found.



From Rollins (1941)



BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Arabis oxylobula Greene

ORIGINAL DESCRIPTION: Greene, Pittoria 1:195. 1900.

COMMON NAME(S): Rockcress

KNOWN DISTRIBUTION: Garfield County, near Glenwood Springs.

HABITAT: Unknown, possibly found in limestone cliffs on southern exposures. Similar to habitat of Arabis demissa, a closely related species (Johnston, personal communication). 5,000-6,000 feet.

DESCRIPTION: Herbaceous perennial plant, 10-12 cm tall. Stems shortly and loosely racemose at the summit. Tufted basal leaves about an inch long, narrowly oblanceolate, acute, entire, the slender petiolar base sparingly hispid-ciliate. Flowers pink, about 5 mm long. Pods about 5, linear, straight, about 3/4 inch long, acute, spreading or a little deflexed on short filiform pedicels; valves with a distinct midnerve; seeds imperfectly biserial. Flowering and fruit: June (Greene 1900).

TAXONOMIC PROBLEMS: Relationship to the Arabis demissa complex should be studied (Johnston, personal communication).

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown, possibly U.S. Forest Service.

REMARKS: Known from two collections made by Osterhout in 1899 and 1902, not rediscovered since then despite extensive field efforts.

SCIENTIFIC NAME: Arabis oxylobula Greene

ORIGINAL DESCRIPTION: Greene, Pittonia 4:195 (1900). Also described by Rollins, Rhodora 43:386 (1941).

COMMON NAMES: Unnamed Rock-Cress

KNOWN DISTRIBUTION: Glenwood Canyon above Glenwood Springs, eastern Garfield County, Colorado.

HABITAT: In cracks in horizontal rock beds, exposed rimrock of bluish-gray limestone forming the uppermost "breaks" in the canyon walls, in exposed sunny situations very close to the edge of the cliffs with roots tightly jammed into the cracks, very little soil development, 7000-7800 ft.

DESCRIPTION: Perennial herb; basal leaves narrow, pointed, hairless or with a very few simple trichomes; stems 6-12 cm high, hairless, with a few stem-leaves that are remote (that is, far apart, not overlapping one another); flowers cruciferous, pale pinkish-white; fruit on a pedicel 3-6 mm long, narrow, with one row of seeds, spreading at almost right angles to the stem, 1.5-2.5 cm long, 1.5-2 mm wide. Flowers in late May or early June, fruit in mid- to late June.

TAXONOMIC PROBLEMS: This species is very closely related to Arabis demissa and var. demissa occurs on high, rocky benches 5-10 miles away from this canyon; the characters differentiating these two species are minute, but consistently allow one to separate the two: A. oxylobula has hairless or very sparsely pubescent basal leaves with at most simple hairs (A. demissa var. demissa growing close by has leaves covered with forked trichomes), and has shorter siliques (A. demissa has siliques 3-7 cm long) at a greater angle with the stem. They are separate species.

EXISTING OR POTENTIAL THREATS: This species was not seen from 1902 until 1978 which reflects the extreme inaccessibility of the sites in which it grows; apparently, no one had bothered to look for it. Three small populations (totalling 83 individuals) have been seen so far, but in all probability more populations will be discovered when more of this inaccessible habitat is searched. No Threats have been seen at any of the populations visited so far; the proposed interstate highway through this canyon is at least 1000 feet below these sites.

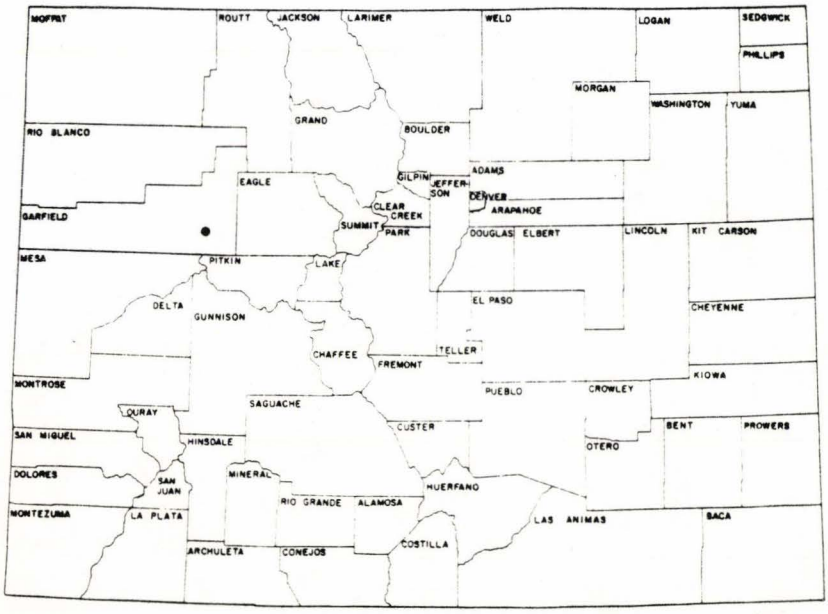
LAND OWNERSHIP/MANAGEMENT: White River National Forest (Eagle Ranger District); possibly also Bureau of Land Management or private.

REMARKS: Proposed as Endangered in Federal Register, July 1, 1975, and again in Federal Register, June 16, 1976.

Arabis oxylobula
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

No Illustration Available



BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Braya humilis (C.A. Meyer) Robinson ssp. ventosa Rollins

ORIGINAL DESCRIPTION: Rollins, Rhodora 55:114. 1953.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Park County, alpine area in the vicinity of Hoosier Pass. Representative locality: T 8S, R 78W.

HABITAT: Steep rocky slopes near alpine tundra, B. humilis plants frequently concealed by rocks and other plants; 12,000 feet.

DESCRIPTION: Herbaceous perennial plants, 3-6 cm tall. Stems several to numerous, arising from a basal rosette. Leaves entire, spatulate, thickened, 1-2 cm long, 2-3 cm wide. Stem leaves few. Leaves and stems pubescent with 2 to 3 branched trichomes. Inflorescence dense, composed of white flowers, often covering the whole stem. Siliques round in cross-section, widely spreading or diverging, 1.5-2 cm long, 1 mm wide, with 2-branched trichomes. Flowering and fruit: early to mid July (Rollins 1953).

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: The one known population near a road and possibly subject to disturbance.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service

REMARKS: A highly restricted subspecies, representing a disjunct from related subspecies found in the North American Arctic. Extremely small population (less than 100 plants), and no others discovered in the vicinity despite extensive field efforts (Johnston, personal communication).

Braya humilis ssp. ventosa
U.S.D.A. Forest Service

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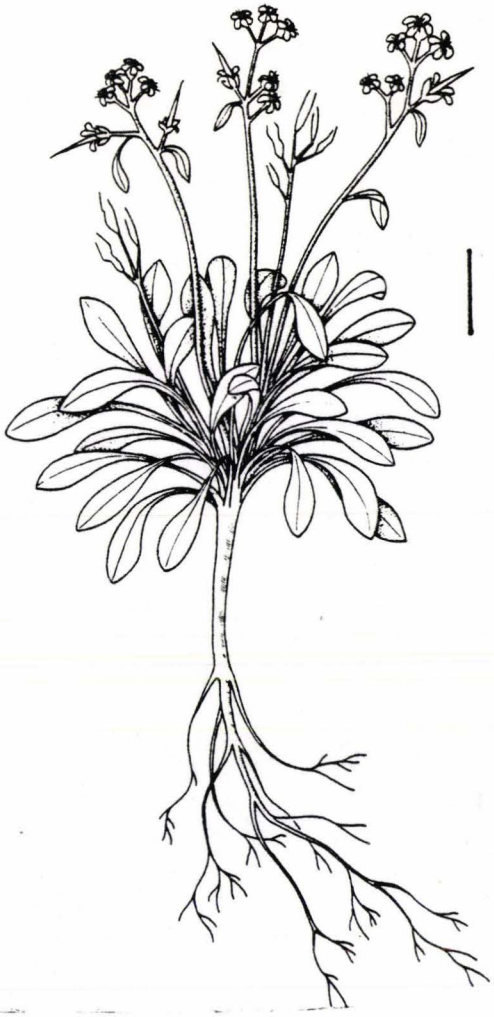
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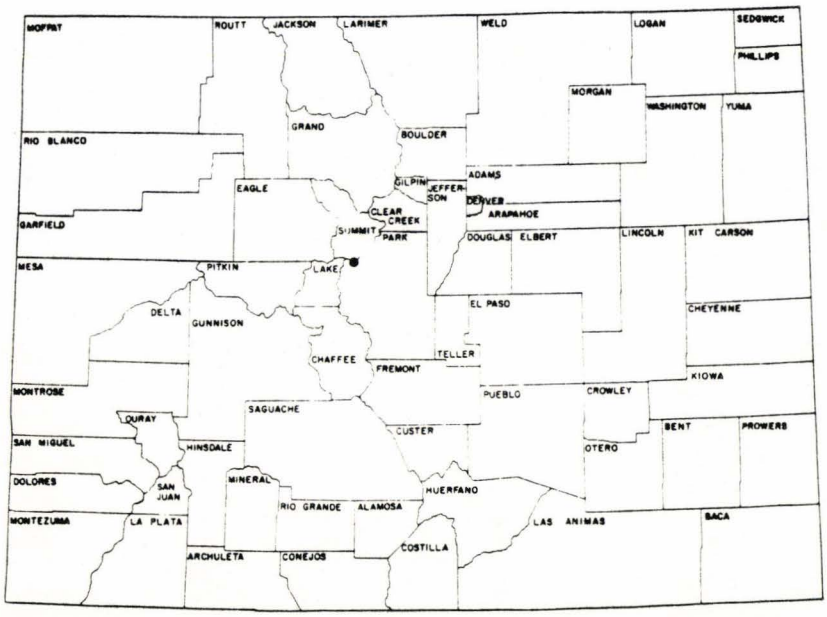
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BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Draba exunguiculata (Schulz) C.L. Hitchcock.

ORIGINAL DESCRIPTION: As Draba chrysantha var. exunguiculata Schulz, Pflanzenreich 4(105): 194. 1927; C.L. Hitchcock, Univ. Wash. Publ. Biol. 11:46. 1941.

COMMON NAME(S): Whitlow-wort

KNOWN DISTRIBUTION: Summit, Park, El Paso, Clear Creek, Gilpin, Boulder, Routt Counties; alpine areas in the Front Range, possibly more widespread. Representative localities: T 3S, R 74W.

HABITAT: Alpine, rocky areas 11,000-13,000 feet.

DESCRIPTION: A tufted, perennial plant growing 2-7 cm tall. Persistent basal leaves, 10-25 mm long and 1-3 mm wide, form thick tufts; 1-3 leaves occur on the stems. Leaves linear to oblanceolate and sparsely hairy, with only a few simple or sometimes branched hairs. Yellow flowers crowded (5-20 flowers) in racemes without bracts (Hitchcock 1941). Flowering and fruit: late July, early August.

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service

REMARKS: None.

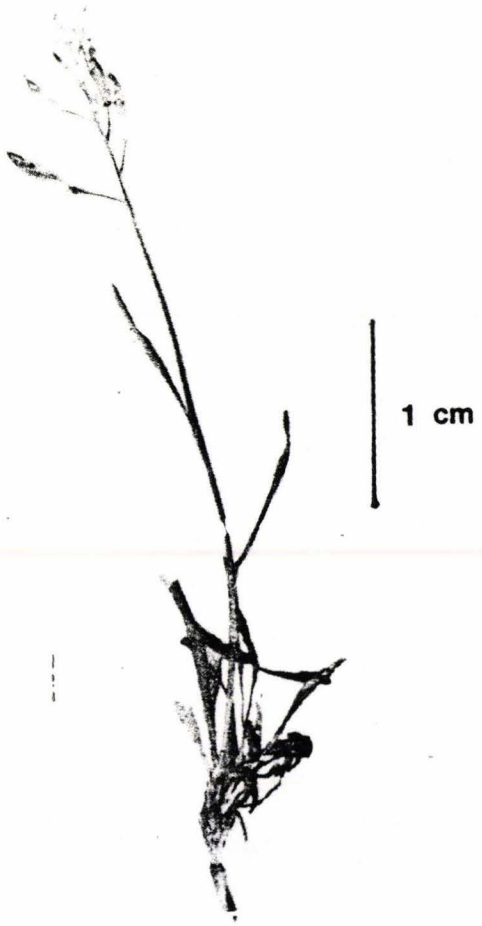
Additional Comments on Draba exunguiculata:

This species is currently being studied by Robert Price, University of Wisconsin; he has visited several sites for this species, surveyed the populations and studied all known herbarium specimens. The map has been redone to conform with his preliminary findings.

Robert Price also feels that this species is neither Threatened nor Endangered; several of its populations number over 1000 individuals with no apparent Threats.

The species is now known from Clear Creek, Boulder, El Paso, Gilpin, Grand, Park, and Summit Counties, Colorado.

Land Ownership/Management: Arapaho and Roosevelt National Forests (Boulder, Golden and Sulphur Springs Ranger Districts), Pike and San Isabel National Forests (Pikes Peak District and possibly also South Park District), White River National Forest (Dillon District), City of Boulder, and Denver Mountain Parks.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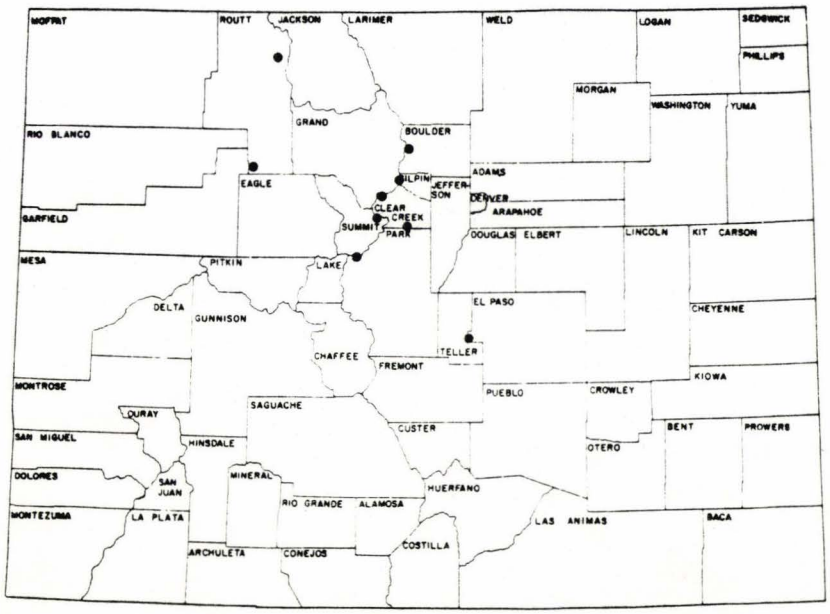
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BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Eutrema penlandii Rollins

ORIGINAL DESCRIPTION: Rollins, Contr. Gray Herb. 171:51. 1950.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Summit, Lake, and Park Counties in vicinity of Hoosier Pass. Representative locality: T 8S, R 77W.

HABITAT: Roots in moss in alpine bogs; 12,300-12,800 feet elevation.

DESCRIPTION: Herbaceous perennial with one to few decumbent to erect stems, 3 - 8 cm high; ovate, glabrous basal leaves have long, slender petioles, 1-2.5 cm long, with cordate blades and rounded apicies; cauline leaves few and narrow (1-1.5 cm long, 2-3 mm wide). Flowers small (2-3 mm long, less than 1 mm wide) with white, ligulate petals and purplish sepals. Narrowly elliptical siliques also small, 1.5 mm wide, 4-8 mm long (Rollins 1950). Flowering and fruit: late July.

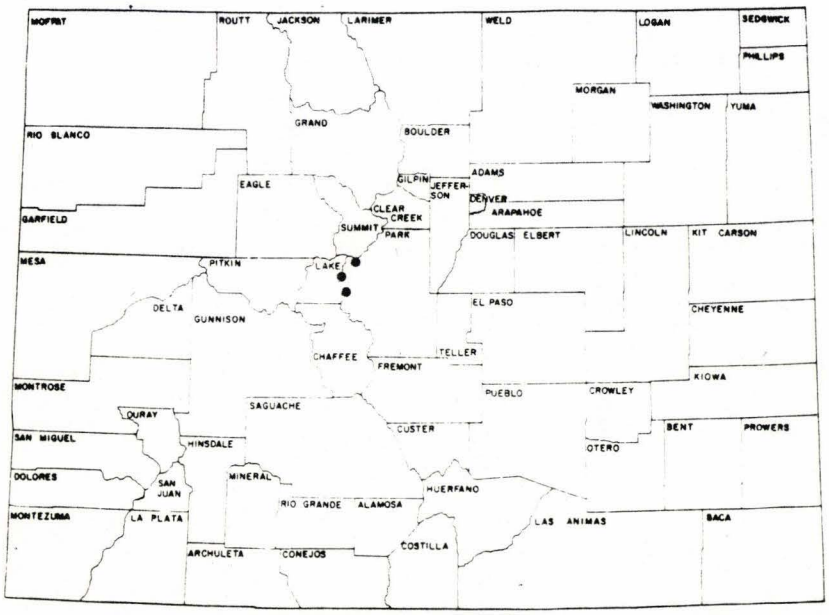
TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: No current threats noted, but habitat extremely fragile (Johnston, personal communication).

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service and Bureau of Land Management

REMARKS: A similar species is E. edwardsii, a circumpolar species in the arctic and subarctic.

1 cm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BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Lesquerella pruinosa Greene

ORIGINAL DESCRIPTION: Greene, Pittonia 4:307. 1901.

COMMON NAME(S): Bladderpod

KNOWN DISTRIBUTION: Archuleta County, vicinity of Pagosa Springs
Representative locality: T 35N, R 2W.

HABITAT: 7000 feet; dry hills and in adobe soil of dry mesas.

DESCRIPTION: Plant perennial, 10-25 cm tall from a woody caudex which is usually not branched, and stellate pubescent. Leaves basal, oval shaped, with long petioles about twice the length of the blades; cauline leaves obovate. Flowers yellow on sigmoid pedicels 5-10 mm long, somewhat crowded in an elongated inflorescence. Siliques not stellate pubescent. Flowering: May, June; Fruit: mid-June, July (Greene 1901).

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: Known population adjacent to road and construction activities, use of habitat by motorcyclists (Johnston, personal communication).
LAND OWNERSHIP/MANAGEMENT: Private

REMARKS: Probably one of Colorado's most endangered species because of its small population and proximity to development activities (Johnston, personal communication).

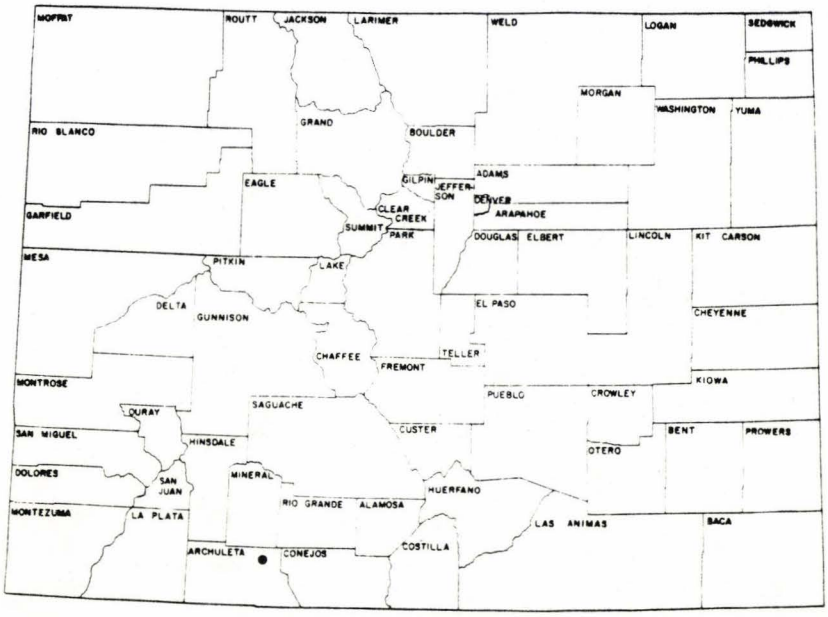
Additional Comments on Lesquerella pruinosa:

This species until 1978 was known from one population which, as the information on page 38 notes, has been severely depleted by unwise land-use practices; this population is now limited to about 50 individuals and is limited to areas where the soil substrate has not been disturbed. This species grows on black-clay slopes derived from the Mancos shale, usually where the soil has been developed to a depth of about 6 inches, with shale bedrock underneath. This allows the plants of this species to attach the ends of the long taproot and branches firmly into the cracks between the varves of the shale.

During 1978 the U.S. Forest Service discovered three more populations, two of them close to Pagosa Springs, and the other a few miles to the south. The populations close to Pagosa Springs are on private land and are in good health in spite of fairly heavy grazing by cattle. The other population is within the San Juan National Forest (Pagosa Ranger District) and also shows good health. Several plants of this population are apparently over 20 years old. The total number of plants known of this species is now about 1500, and it is quite possible that a few more populations will be discovered in the future.

The first discovered population is obviously in danger, but the others have no Threatening or Endangering factors evident.

1 cm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BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Parrya nudicaulis(L.) Regel

ORIGINAL DESCRIPTION: As Cardamine nudicaulis L. Sp. Pl. (1753); Regel in Gartenfl. (1883), tab. 128, fig. a,b.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Siberia, Alaska

HABITAT: Moist places, sandy slopes.

DESCRIPTION: Plant with stout root, caudex with remains of old leaves, stem (10 cm tall) leafless, pubescent with stout glands, leaves all basal, ovate, oblong to spatulate, sinuate-dentate with long petiole; petals purple, lavender or rarely white, siliques acute at both ends with long style (Hulten 1968).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

REMARKS: Never reliably reported from Colorado; should be deleted from Colorado list.

BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME: Rorippa coloradensis Stuckey

ORIGINAL DESCRIPTION: Stuckey, Sida 4:303, Fig. 1. 1972.

COMMON NAME(S): Watercress

KNOWN DISTRIBUTION: Southwestern Colorado, probably vicinity of Alamosa, Alamosa County.

HABITAT: Margin of rivers and lakes; 7000 feet.

DESCRIPTION: Herbaceous perennial, weak trailing stems. Stem slender, strigose with elongate pointed often retrorse trichomes; cauline leaves petiolate, non-auriculate, oblong to broadly oblanceolate, 2.3-3 mm long, .5-1 mm wide, shallowly to somewhat deeply sinuate-lobed. The extremely large buds (3.5-5 mm long) and flowers with spatulate petals strongly differentiated into blade and claw make this species distinctive from others in Rorippa. Mature fruit not known (Stuckey 1972).

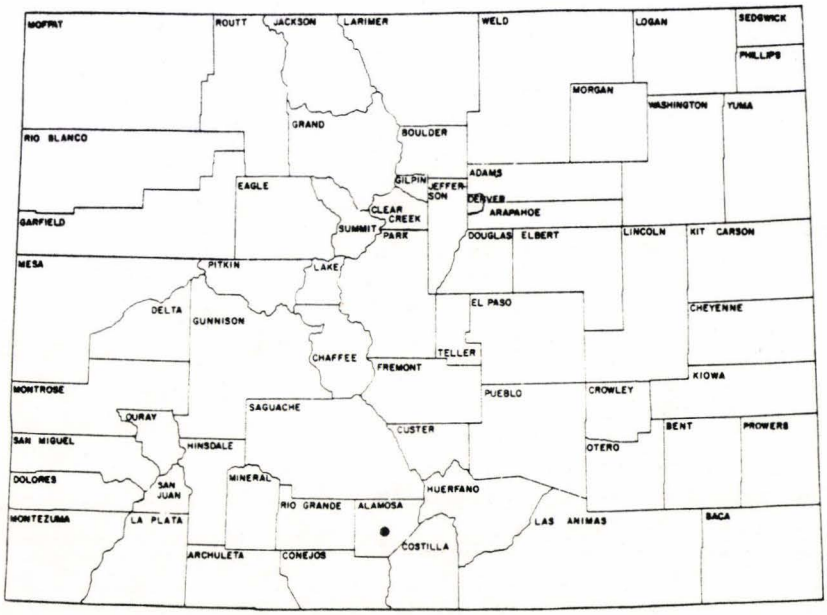
TAXONOMIC PROBLEMS: Unknown

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

REMARKS: Location where original collections made uncertain; not collected since original collections made by Brandegee in 1875. Species not described until Rorippa was monographed by Stuckey.

No Illustration Available



CACTACEAE

SCIENTIFIC NAME: Echinocereus triglochidiatus var. inermis (Schum.) Arp.

ORIGINAL DESCRIPTION: As Echinocereus phoeniceus var. inermis Schum., Monatsschr. Kakt. 6:150. 1896; Arp, Cac. and Succ. Journ. 45:132-133. 1972.

COMMON NAME(S): Spineless hedgehog cactus

KNOWN DISTRIBUTION: Mesa County (Gunnison and Colorado Rivers), Montrose County (Paradox Valley). Representative locality: T 51N, R 13W.

HABITAT: Found in partial shade in duff that accumulates under pinyon pine (Pinus edulis) trees, and infrequently among sagebrush on cool exposures, 5000-8000 feet.

DESCRIPTION: Simple cylindrical or ovoid succulent joints vary from 2-8 cm tall and 3-5 cm in diameter. The grass-green joints grow in clusters of 5 to 15. Eight to nine ribs found on each joint, aerioles spaced 1 to 2 cm apart on the ribs. Spineless condition variable. Some plants entirely spineless, others with one aereole containing 2 cm spines. Deciduous spines sometimes found on new growth. Flowers crimson, arranged laterally on the joint, 5-8 cm in length. Ovary and corolla tube bear short bristly spines. Outer surfaces of the flower are spineless. Fruit bright red, 2 cm long, seeds 1 mm long (Arp 1972). Flowering: April, May; Fruit: May, June.

TAXONOMIC PROBLEMS: Varietal status best describes this species' taxonomic status because the plant occurs in distinct and identifiable populations. Apparent hybrids have been found between inermis and var. melanocanthus resulting in crooked, broken, stunted, and normal spines developing on the same plant.

EXISTING OR POTENTIAL THREATS: Plants may be susceptible to grazing and trampling by livestock, and one population has been depleted by tree removal operations (chaining). This variety has been exploited commercially.

LAND OWNERSHIP/MANAGEMENT: BLM, private.

REMARKS: Recommendation that this species be officially listed as Endangered has been forwarded to the Washington Office of Endangered Species (Fish & Wildlife Service) and final rulemakings are being prepared.

Additional Comments on Echinocereus triglochidiatus var. inermis:

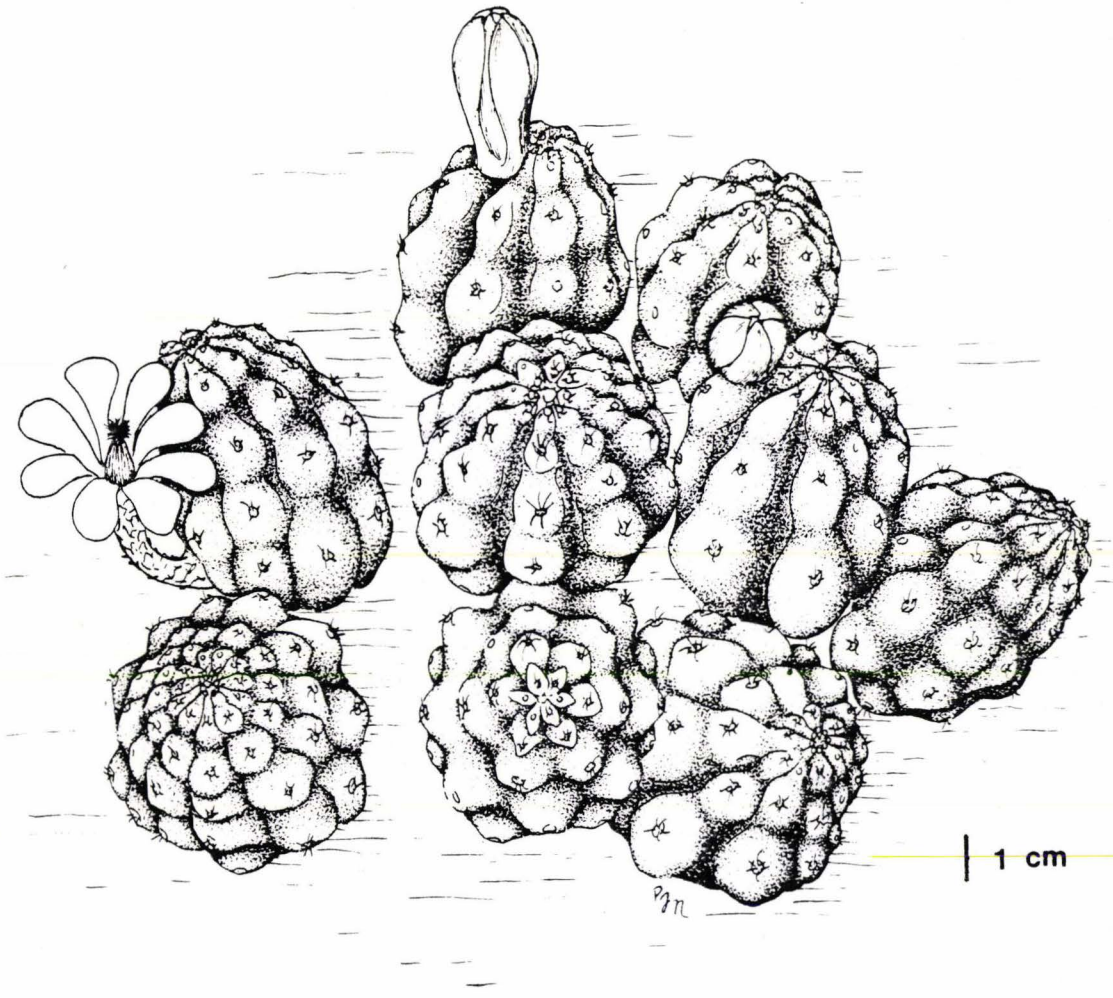
This species is well described on page 43, but the line drawing on page 44 is inaccurate and misleading.

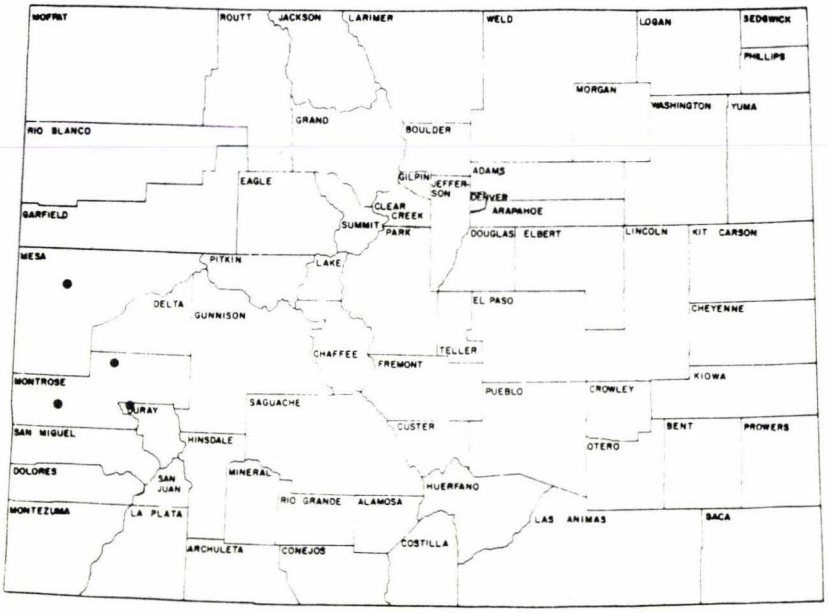
Land Ownership/Management: Bureau of Land Management (Montrose District) and private; possibly also Uncompahgre National Forest (Delta Ranger District).

Echinocereus triglochidiatus var. inermis
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

Echinocereus triglochidiatus var. inermis





CACTACEAE

SCIENTIFIC NAME: Pediocactus knowltonii L. Benson

ORIGINAL DESCRIPTION: Benson, Cac. and Succ. Journ. 32:193. 1960.

COMMON NAME(S): Knowlton's hedgehog cactus

KNOWN DISTRIBUTION: Not yet reliably reported from Colorado, but occurs just south of the Colorado line in New Mexico in the vicinity of Navajo Reservoir near the Los Pinos River (Johnston, personal communication).

HABITAT: Gravelly soils, 6000-6400 feet.

DESCRIPTION: Small, compressed or globose plant, 2.5-15 cm in diameter; with 13-21 spiraled rows of conical tubercles, 1 cm tall, 1 cm in diameter. Short, radial spines white; 12-19 from tops of tubercles; no central spines. Flowers white, yellow, pink or magenta at top of plant (Arp 1972).

TAXONOMIC PROBLEMS: Genus recently revised and some species of Sclerocactus are now thought to be Pediocactus.

EXISTING OR POTENTIAL THREATS: Commercially exploited, with high risk of elimination of remaining populations. Some populations adjacent to Navajo Lake possibly susceptible to flooding.

LAND OWNERSHIP/MANAGEMENT: Ute Indian Reservation in Colorado.

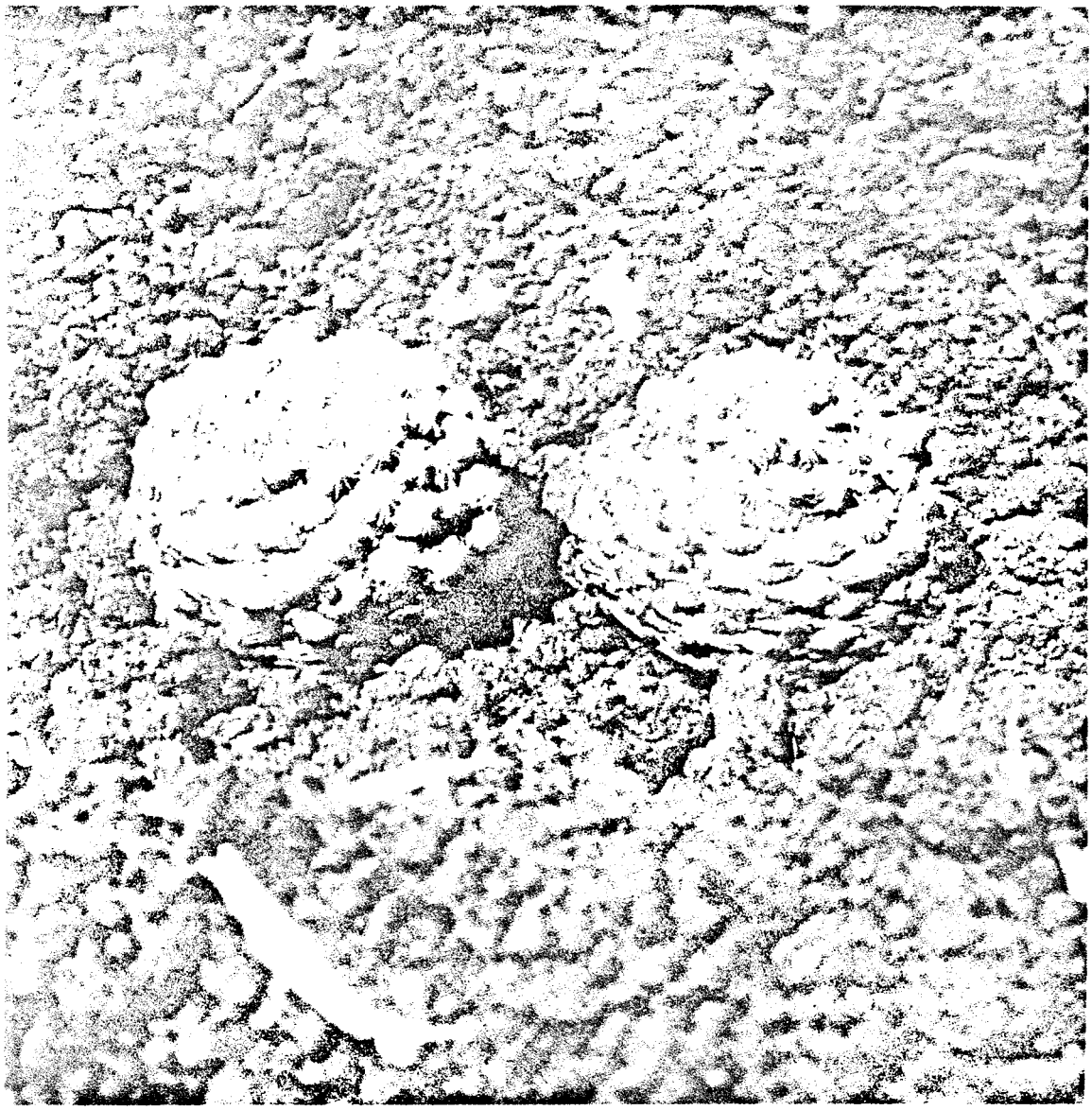
REMARKS: None

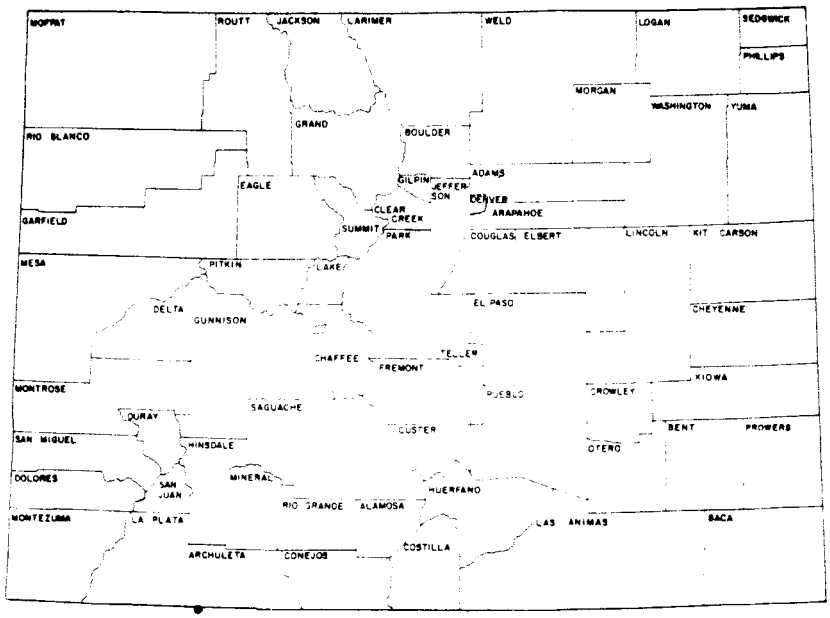
Additional Comments on Pediocactus knowltonii:

This species is presently known from one small population, part of which is in La Plata County, Colorado; it is actively exploited and definitely Endangered. However, as far as is known, no one has been able to conduct extensive searches for other populations; there is much potential habitat in the area, but it is not known how much of it supports populations of this species. In Colorado, this potential habitat is within the Southern Ute Indian Reservation.

The description on page 45 is somewhat misleading. Each plant of this species usually appears as one stem but sometimes as many as eight stems; each of these stems is very small, usually 0.5-1.2 cm in diameter; the stems shown in the photograph on page 46 are each about 0.8 cm in diameter. Flowers in late May, fruit in early to mid-June.

Habitat: On flat to shallow clay slopes in Piñon-Juniper-Sagebrush stand, but usually in exposed situations, growing between small (average 2 in. diameter) rounded multi-colored river rocks forming erosion pavement on soil surface; low benches and hills, 5300-5500 ft.

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ARCHULETA
CONEJOS

CACTACEAE

SCIENTIFIC NAME: Sclerocactus glaucus (Schum.) Benson

ORIGINAL DESCRIPTION: K. Schum. Gesammtb. Kakt.:438. 1898.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Garfield, Mesa, Delta Counties near Colorado and Gunnison Rivers. Also found near the Green River in Utah.

HABITAT: Dry alkaline hills with many rocks; 5000 feet. Associated with Atriplex confertifolia, Hilaria jamesii, and Ephedra sp.

DESCRIPTION: Ovoid or globular succulent stems 3.8-6.2 cm tall, 3.8-5 cm in diameter. Distinguished from the common species Sclerocactus whipplei by the presence of glands above each areole, and the absence of a hooked central spine (Arp 1972). Flowering: April—May; Fruit: May.

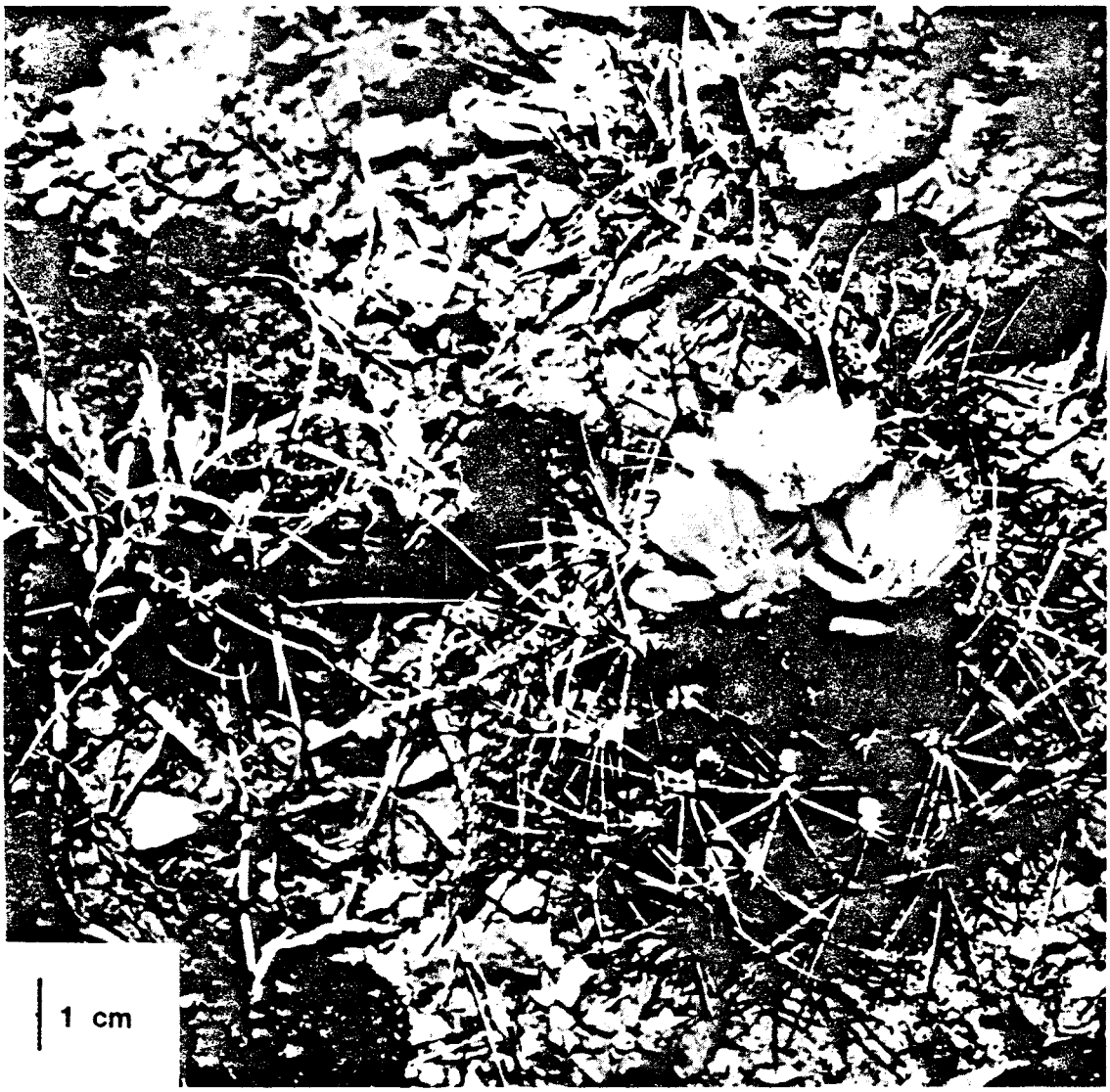
TAXONOMIC PROBLEMS: Appears to hybridize with S. whipplei where the two species are sympatric in the Gunnison River Valley. Recently revised and put into the genus Pediocactus (Arp 1972).

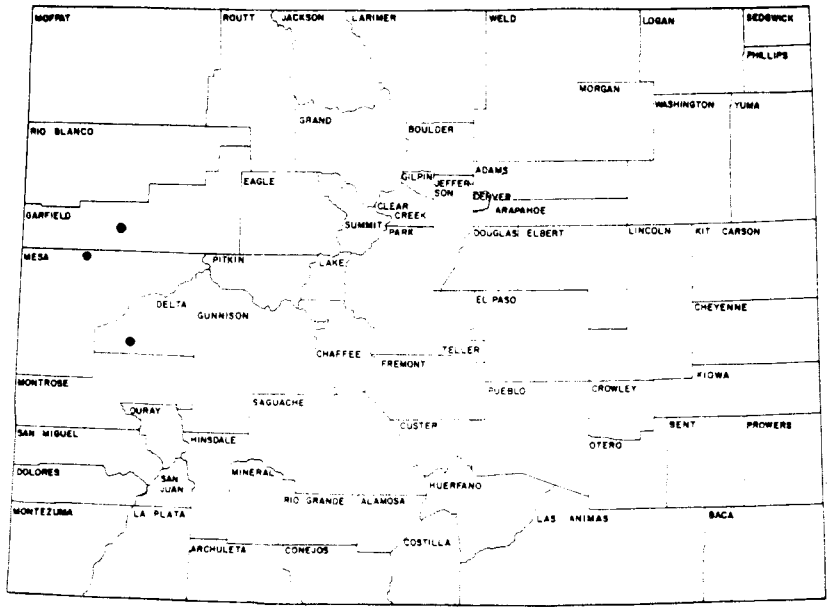
EXISTING OR POTENTIAL THREATS: Some commercial exploitation. Possibly susceptible to trampling by livestock. Some populations possibly threatened by plans to dam the Gunnison River (Dominguez Project).

LAND OWNERSHIP/MANAGEMENT: BLM, private

REMARKS: Recommendation that this species be officially listed as Endangered has been forwarded to the Washington Office of Endangered Species (Fish & Wildlife Service) and final rulemakings are being prepared. S. glaucus does not survive well in cultivation.

Sclerocactus glaucus





CACTACEAE

SCIENTIFIC NAME: Sclerocactus mesae-verdae (Boiss. and Davids.) Benson

ORIGINAL DESCRIPTION: As Coloradoa mesae-verdae Boiss. and Davids., Colorado Cacti 55. 1940; Benson, Leafl. West. Bot. 6:163. 1951.

COMMON NAME(S): Mesa Verde cactus.

KNOWN DISTRIBUTION: Montezuma County, southern portion of Mesa Verde National Park and adjoining Ute Indian Reservation; Montrose County, Uncompahgre Plateau. Also found in the vicinity of Shiprock, New Mexico.

HABITAT: Adobe hills, dry clay soils; 4000-5000 feet.

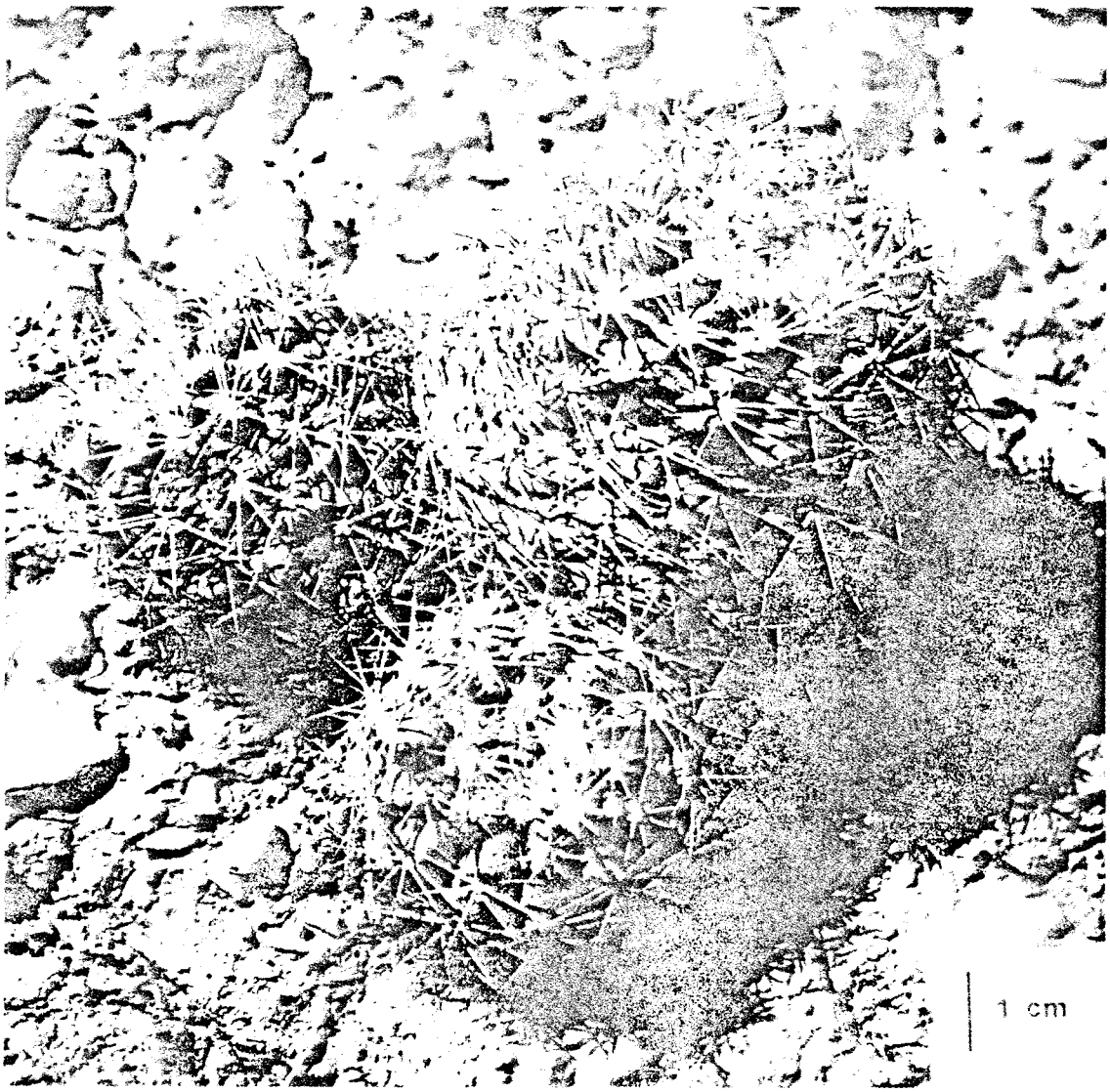
DESCRIPTION: Plants solitary or growing in tufts; about 6 cm high; globose, not jointed; with 13-17 more or less vertical or spiral continuous ribs; no glochids present. Flowers vertical or nearly so, coming from special areoles just above an immature spine-producing areole at the stem apex; 3.5 cm long; yellow to greenish-white; tube naked or with a few scales (these not hairy in the axils). Fruit naked; seeds large (4 mm long); black (Harrington 1964). Flowering: April, May; Fruit: May.

TAXONOMIC PROBLEMS: Considerable intergradation occurs among the taxa within Sclerocactus which causes numerous problems. Formerly Echinocactus mesae-verdae. Recently revised and included in genus Pediocactus (Arp 1972).

EXISTING OR POTENTIAL THREATS: Heavy commercial exploitation threatens remaining populations. The species does not persist well in cultivation.

LAND OWNERSHIP/MANAGEMENT: Ute Indian Reservation, NPS, BLM (species not located on Colorado BLM land south of Mesa Verde National Park by Ratzloff).

REMARKS: None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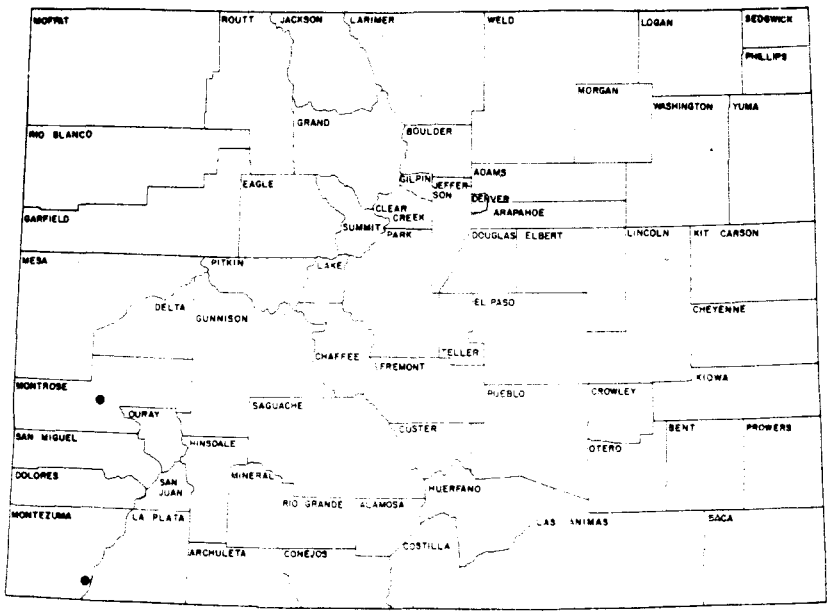
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LA PLATA
LAS ANIMAS
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ARCHULETA
CONEJOS
COSTILLA

CARYOPHYLLACEAE

SCIENTIFIC NAME: Stellaria irrigua Bunge

ORIGINAL DESCRIPTION: Bunge, Verz. Suppl. Fl. Alt. 35. 1835.

COMMON NAME(S): Starwort.

KNOWN DISTRIBUTION: Alpine areas in Gunnison, Hinsdale, La Plata, Mineral, San Juan, and San Miguel Counties. Disjunct from populations in the Altai Mountains, USSR. Representative locality: T 12S, R 86W.

HABITAT: Gravelly talus slopes, hard packed soils; 12,000 feet. Found in association with Ligularia soldanella.

DESCRIPTION: Small, fragile herbaceous perennial species, 2-3 cm tall. Stems either branched at base or simple. Leaves dark green or reddish, less than 1 cm long. Inflorescence contains white flowers, usually overtopped by terminal leaves (Ratzloff 1977). Petals bifid, and frequently shorter than the sepals. Flowering: mid-July; Fruit: early August.

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: None known, but species occupies a habitat that is very sensitive and easily disturbed.

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service

REMARKS: This species ranges widely in the Elk and San Juan Mountains, and may be a candidate for deletion from the Federal List (Wilken, personal communication).

Additional Comments on Stellaria irrigua:

This species is now known from Ouray and Huerfano Counties, Colorado, and Colfax County, New Mexico, in addition to the Counties listed on page 51 .

Ownership/Management: Gunnison National Forest (Taylor River and Cebolla Ranger Districts); Bureau of Land Management (Montrose District); Uncompahgre National Forest (Norwood and Ouray Ranger Districts); San Juan National Forest (Mancos, Animas and Pagosa Ranger Districts), and San Isabel National Forest (San Carlos Ranger District).

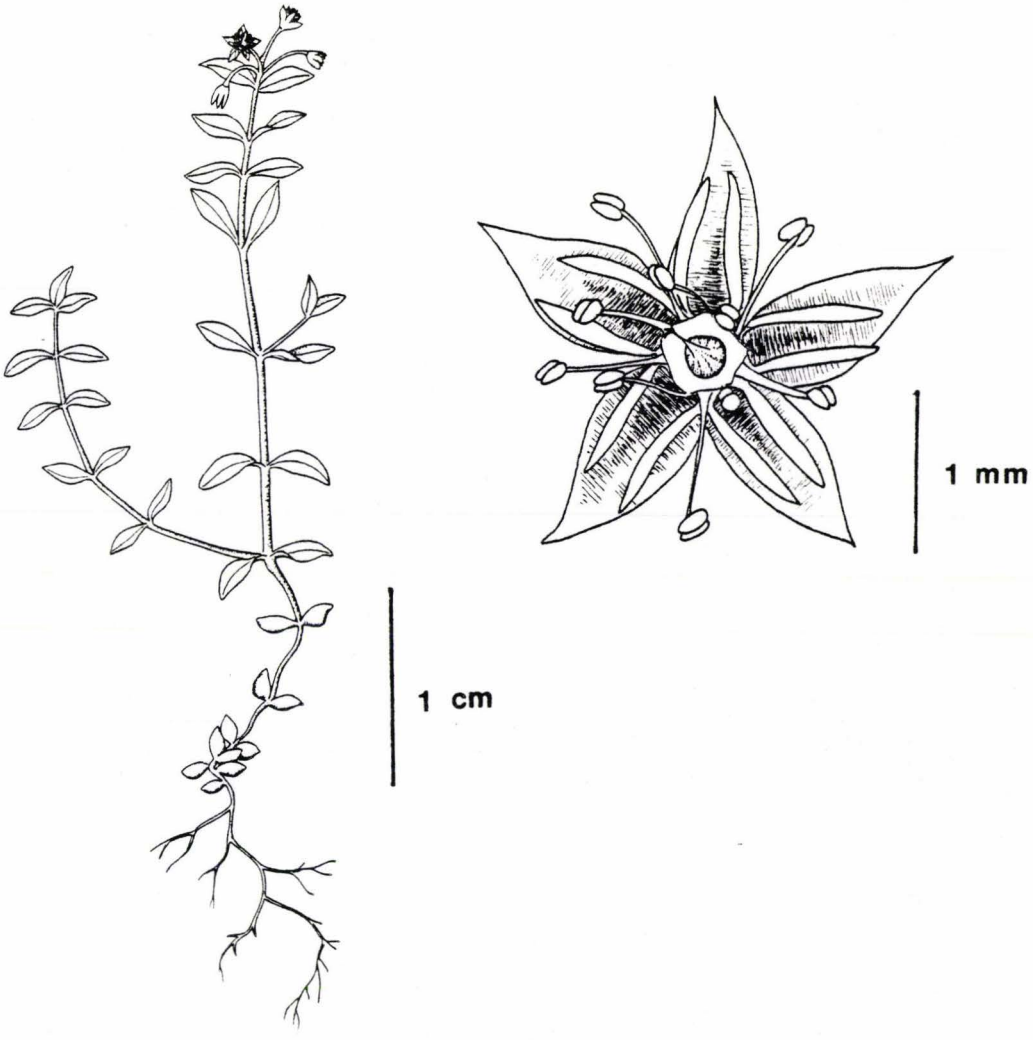
Additional Comments on Stellaria irrigua:

This species is now known from Ouray and Huerfano Counties, Colorado, and Colfax County, New Mexico, in addition to the Counties listed on page 51 .

Ownership/Management: Gunnison National Forest (Taylor River and Cebolla Ranger Districts); Bureau of Land Management (Montrose District); Uncompahgre National Forest (Norwood and Ouray Ranger Districts); San Juan National Forest (Mancos, Animas and Pagosa Ranger Districts), and San Isabel National Forest (San Carlos Ranger District).

Stellaria irrigua
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library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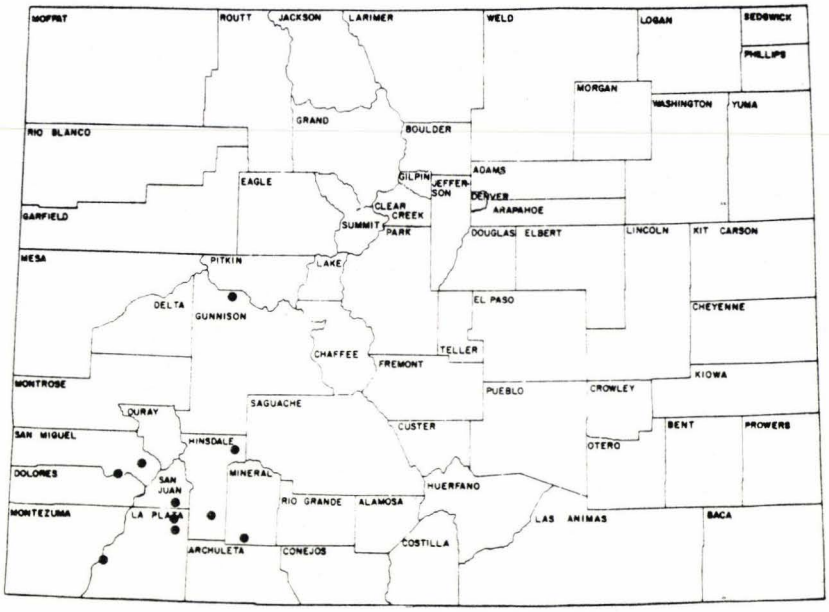
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CONEJOS
COSTILLA

CHENOPODIACEAE

SCIENTIFIC NAME: Atriplex pleiantha W.A. Weber

ORIGINAL DESCRIPTION: Weber, Madrono 10:189. 1950

COMMON NAME(S): None

KNOWN DISTRIBUTION: Montezuma County, Mancos River. Representative locality: T 32N, R 19W.

HABITAT: Barren clay slopes of low hills, 5100 feet.

DESCRIPTION: Herbaceous, erect annual, .5 - 1.5 dm tall, much branched from the base. Stem and branches commonly white or reddish. Leaves alternate, round to ovate, with an acute or obtuse apex and a truncate or cuneate base; sparsely mealy or whitish. Flowers monoecious, with 2 to 6 pistillate flowers subtended by triangular-ovate bracts. Bracts united only at the very base. Utricle suborbicular, compressed, black smooth and shining, 1.5 mm long, falling free at maturity, not permanently enclosed within the bracts; seed vertical; radicle inferior (Weber 1950). Flowering: June; Fruit: June—July.

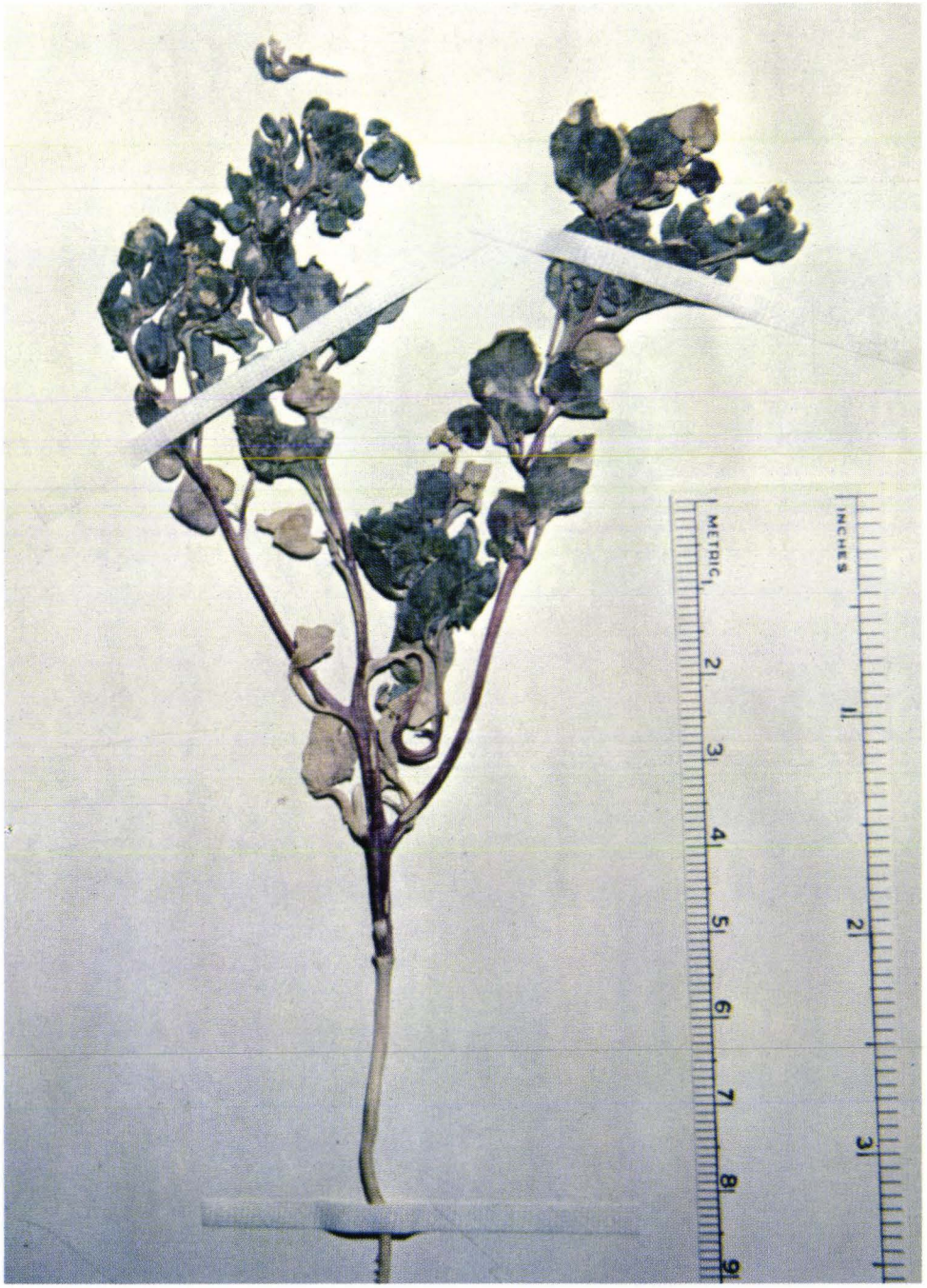
TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Ute Indian Reservation

REMARKS: Unique population (cited above).

Atriplex pleiantha
U.S.D.A. Forest Service



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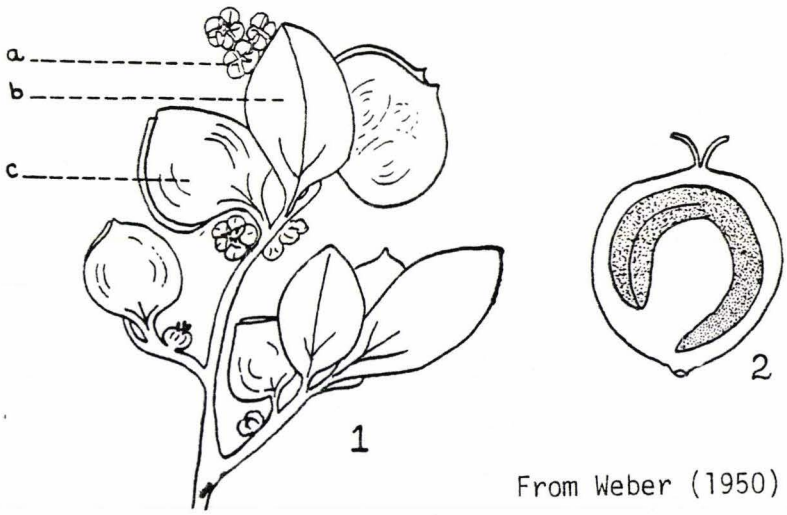
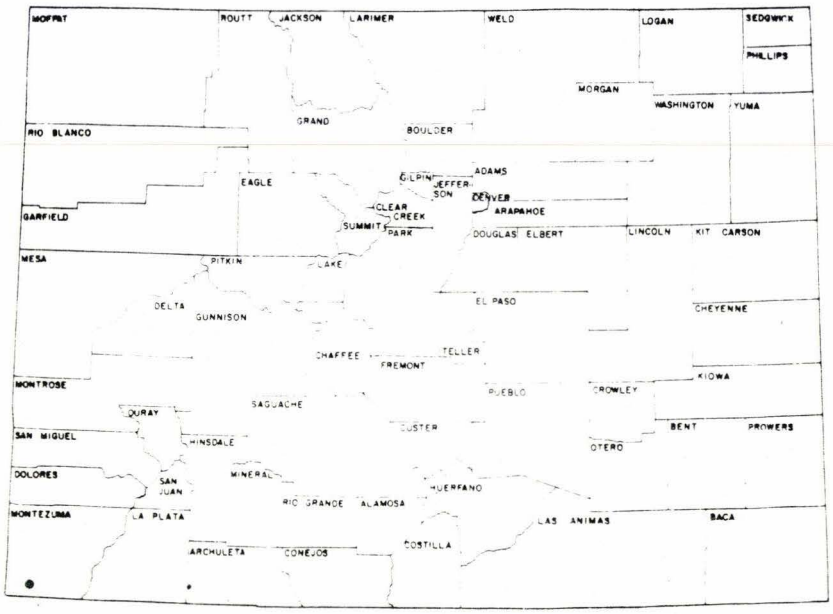


FIG. 2. *Atriplex pleiantha* Weber, *1*, portion of plant (×5), showing *a*. staminate flower, *b*. leaf, *c*. bract of carpellate flower cluster; *2*, gynoecium showing position of embryo (×15); *3*, perianth segment of carpellate flower (×30); *4*, diagrammatic representation of ventral view of bract showing enclosed cluster of carpellate flowers (×6).



CYPERACEAE

SCIENTIFIC NAME: Carex microptera Mack. var. crassinervia F.J. Herm.

ORIGINAL DESCRIPTION: F.J. Hermann, Rhodora 70:420. 1968.

COMMON NAME(S): Sedge

KNOWN DISTRIBUTION: Ouray County, Colorado; Natrona County, Wyoming.

HABITAT: Open parks and basins, in wet meadows; 11,000 feet in Colorado and 7900 feet in Wyoming.

DESCRIPTION: Culms 3-10 cm high from densely tufted bases, with fine longitudinal lines at the base, triangular near the top. Leaf blades flat, 1-3 cm long, 2-4.5 mm wide. Spikes of inflorescence closely bunched forming ovoid or suborbicular heads 12-18 mm long, and 10-16 mm wide with pistillate spikes occurring above the staminate spikes. Scales dull brown, with a lighter midrib (obscure) and translucent white margins. Variety crassinervia differs from the typical C. microptera only in the stout 5-7 ventral nerves on the perigynia. In the typical species, perigynia have only a few inconspicous nerves. Flowering: August (Hermann 1970).

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: U.S. Forest Service

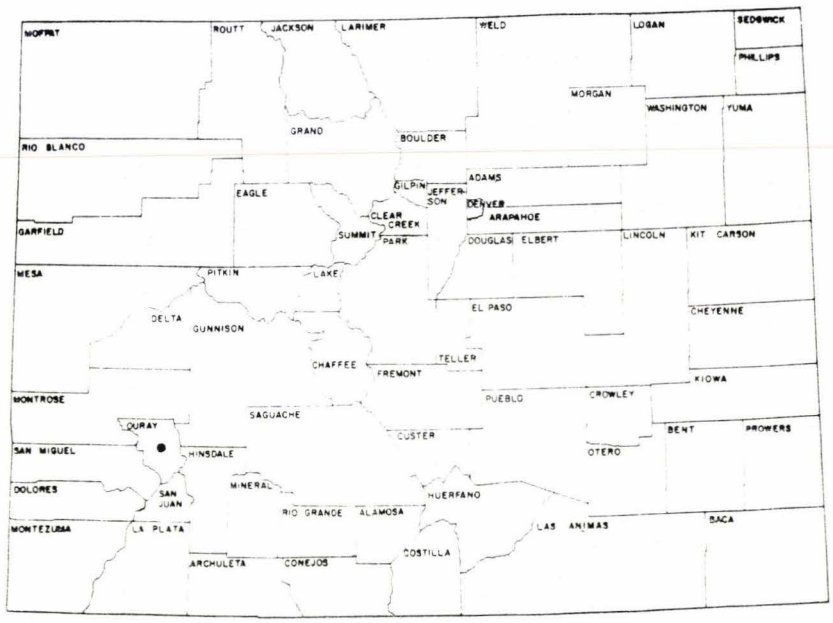
REMARKS: None

1 cm

1 mm

perigynium

From Hermann (1970)



FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus deterior Barneby

ORIGINAL DESCRIPTION: Barneby, Leafl. West. Bot. 7:35. 1953.

COMMON NAME(S): Cliff-palace milkvetch

KNOWN DISTRIBUTION: Montezuma County; Mesa Verde National Park. Representative locality: T 34N, R 15W.

HABITAT: Found on dry rocky mesas, on sand-filled depressions of flat or shelving rock, seeding down to loose sandy talus; with juniper and pinyon; 5000-7000 feet.

DESCRIPTION: Low growing, perennial plants with short or obsolete stems; narrow stipules at base of plant are connate; flowers yellowish-white from root crown or shortly forming caudex or cream colored (faintly purple-veined) arranged in 2-5 small, loosely ascending racemes, with shallow-campanulate calyx tube; keel with deltoid apex. Flowers smaller (10-11 mm) than a similar species A. naturitensis. Pods with short, stiff, appressed hairs, 8-10 ovules, elevated on a stipelike gynophore (0.2-1 mm long), trigonously compressed, flowering in May (Barneby 1953).

TAXONOMIC PROBLEMS: Formerly a variety of A. naturitensis.

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: National Park Service.

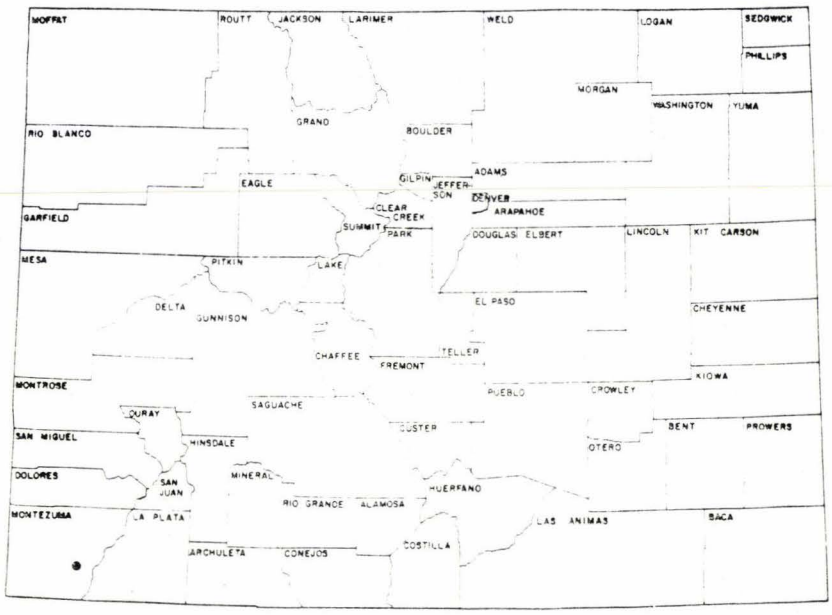
REMARKS: None

Additional Comments on Astragalus deterior:

The correct name for this species is Astragalus deterior (Barneby) Barneby. Barneby changed the status of this to a full species in Leaflets West. Bot. 7:36 (1953), but it was originally described by Barneby in Leaflets West. Bot. 5:88 (1948). This original description in 1948 was as Astragalus naturitensis var. deterior Barneby. Another description was provided in Mem. N. Y. Bot. Gard. 13:724-725 (1964).

The species is still known only from Mesa Verde National Park.

No Illustration Available



FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus detritalis M. E. Jones

ORIGINAL DESCRIPTION: Jones, Contrib. West. Bot. 13:9. 1910.

COMMON NAME(S): Debris milkvetch

KNOWN DISTRIBUTION: Rio Blanco County, White River Valley. Representative locality: T 1N, R 94W.

HABITAT: Barren sandy clay soil on detrital slopes of sandstone outcrops; with sagebrush; 5400-7000 feet; exposed white shales of southern periphery of Uintah Basin, associated with Lesquerella and Penstemon.

DESCRIPTION: Cushion or close (2-6 cm tall) thick mat-forming perennial. Leaves 1-2 cm long, narrowly oblanceolate or linear, with gray or white silky hairs. Upper leaves have 3-5 leaflets, lower leaves are simple. Flowers are purple, and arranged in racemes. Pods flat, elliptic to linear in outline, laterally compressed, with prominent sutures, 15-31 mm long. Flowering in May (Harrington 1964).

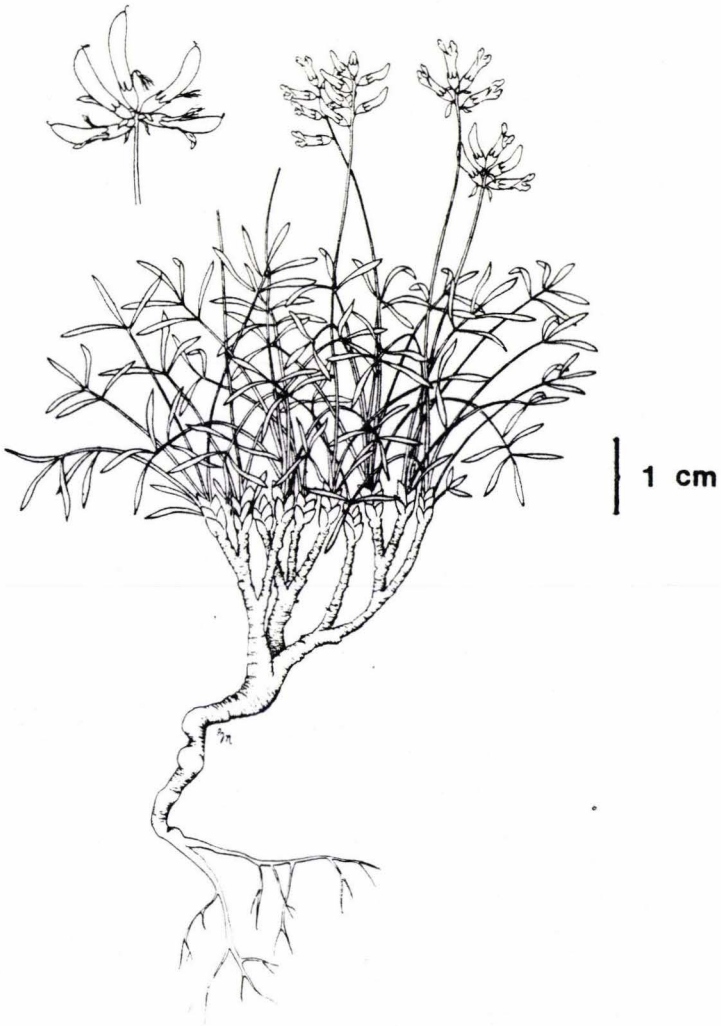
TAXONOMIC PROBLEMS: None known

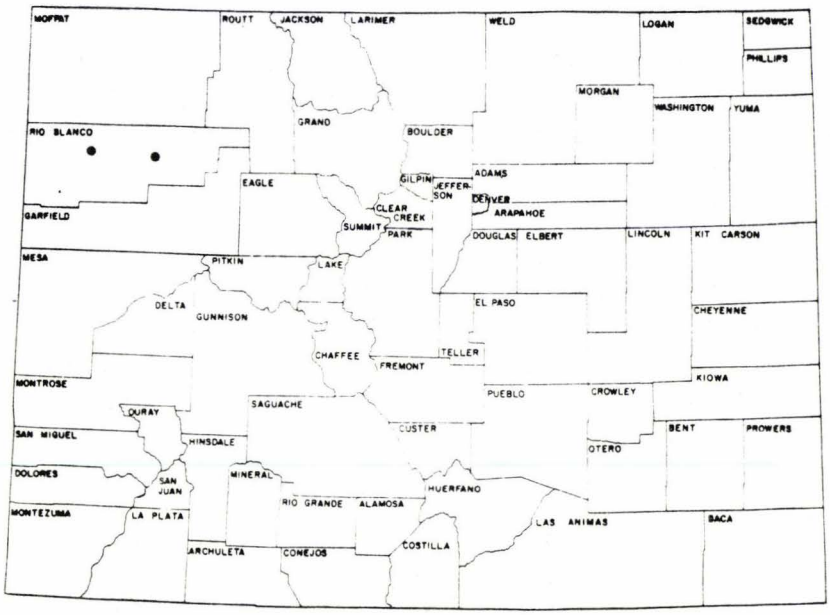
EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM and private

REMARKS: "Local, but forming colonies at scattered stations within the Uintah Basin in Duchesne, Uintah Counties, Utah, and Rio Blanco County, Colorado" (Barneby 1964).

Astragalus detritalis





FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus humillimus Gray ex Brand.

ORIGINAL DESCRIPTION: Gray ex Brandegee, Bull. U.S. Geol. Surv. 23:235. 1876

COMMON NAME(S): Mancos milkvetch

KNOWN DISTRIBUTION: Montezuma County, Mesa Verde, near the Mancos River.

HABITAT: "It is to be sought in crevices of rimrock pavement and on sand-filled ledges of shelving rock masses, the ecological niches in which several specialized Basin astragali have found a congenial home" (Barneby 1964); 6000 feet.

DESCRIPTION: Diminuitive, tufted perennial, cinereously strigulose; stems .5-1 cm long; stipules submembranous, becoming papery, deltoid-ovate; leaves 8-15 mm long shortly petioled, leaflets .7-2 mm long; peduncles 2-4 mm long; racemes very shortly 1-3 flowered; calyx 3 mm long; pod spreading, sessile, oblong ellipsoid, 4.5 mm long, 2 mm in diameter, carinate by the prominent sutures, the strigulose valves becoming stiffly papery and stramineous (Barneby 1964). Flowering and fruit: June and July.

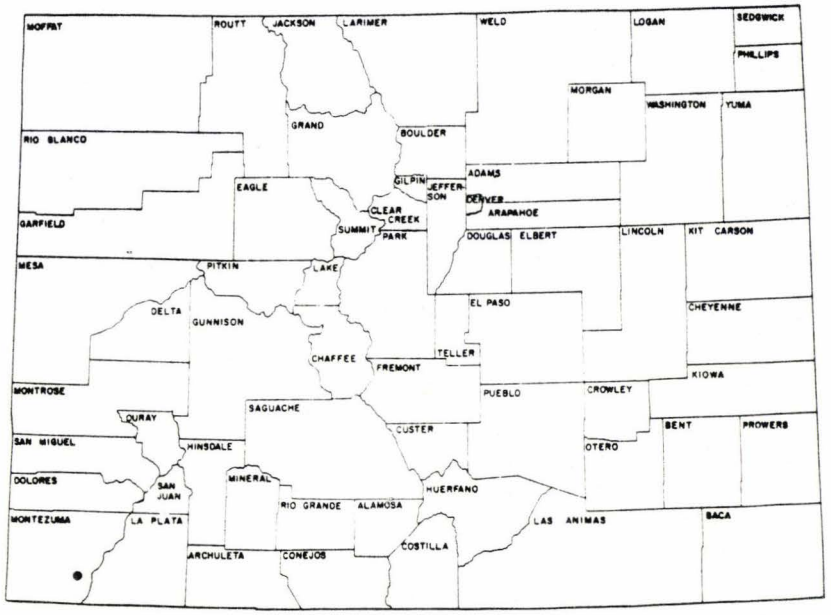
TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: National Park Service, Ute Indian Reservation.

REMARKS: Known only from the type. Has not been rediscovered since Brandegee collected the type in July 1875 (Barneby 1964).

No Illustration Available



FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus linifolius Osterhout.

ORIGINAL DESCRIPTION: Osterhout, George E., Bull. Torr. Bot. Club 55:75. 1928.

COMMON NAME(S): Grand Junction milkvetch

KNOWN DISTRIBUTION: Mesa County, along Colorado River near Grand Junction "6 miles across Colorado River from Grand Junction" (Osterhout 1928), possibly in what is now Colorado National Monument.

HABITAT: Dry adobe hills and sandstone areas; 4500 feet.

DESCRIPTION: Perennial plant, stems 3.5-4 dm long, shortly subterranean at base. Leaves are slender, pinnate with 2-5 leaflets, attached at a node or joint and separate at maturity leaving a clean-cut scar. Flowers yellowish-white (originally purple, but fade), sometimes with a purple tip, 15 mm long, and occur in racemes. Sessile pods are rounded in cross section, 15 mm long, 5-6 mm wide, do not nod, and have two prominent but not intruded sutures. This species closely resembles A. rafaelensis which has dark purple, longer (18-25 mm) flowers and flat, nodding pods. A. rafaelensis is known from Dinosaur National Monument Headquarters near Jensen, Utah, close to Moffat County, Colorado. Blooms in June (Osterhout 1928).

TAXONOMIC PROBLEMS: Since a specimen has not been found recently, it is not certain if A. linifolius is a separate species. It resembles both A. rafaelensis and A. toanus (in fruit), and the three species could be one discontinuously dispersed species. A. linifolius appears to be varietally distinct (Barneby 1964).

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: NPS, BLM, or private land

REMARKS: None

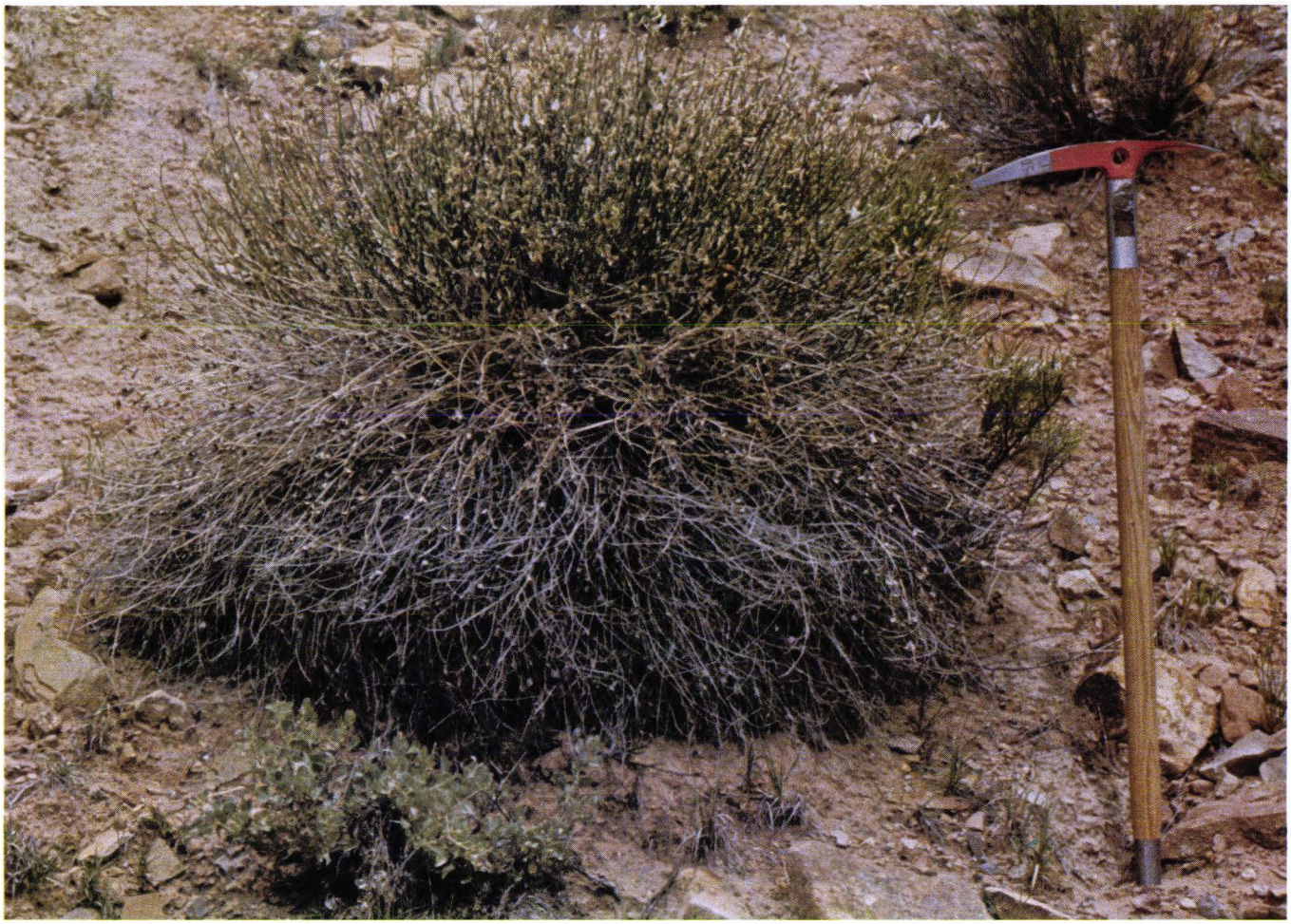
Additional Comments on Astragalus linifolius:

This species was rediscovered in the spring of 1978 in north-central Montrose County, Colorado. It still remains lost at what must be presumed to be its type locality in central Mesa County, Colorado.

Habitat: dry clay slopes and hills, or in flat gully bottoms under cottonwoods, forming large conspicuous tufts and mounds to 1 m high and wide, often with the dried remains of previous years' stems matted at the base of the plant, 5400-5700 ft. The habitat description given on page 63 was simply a guess.

This species is now known from about four medium sized populations on private land and that of the Bureau of Land Management (Montrose District); no Threats were noted at any of the known populations. This entity seems at least varietally distinct from the species mentioned under Taxonomic Problems on page 63, but the matter is still being studied taxonomically.

Astragalus linifolius
U.S.D.A. Forest Service



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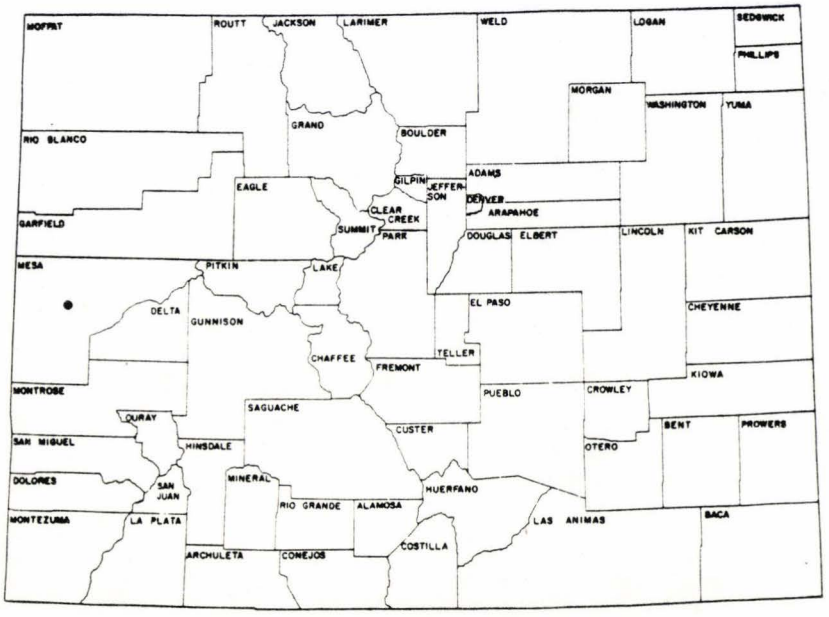


FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus microcymbus Barneby

ORIGINAL DESCRIPTION: Barneby, Am. Midl. Nat. 41:499. 1949.

COMMON NAME(S): Milkvetch

KNOWN DISTRIBUTION: Gunnison County, vicinity of Gunnison. Representative locality: T 49N, R 86W.

HABITAT: In sandy soil along roadsides with foreign weeds, and on sagebrush slopes; 7600-7700 feet.

DESCRIPTION: Taller (30+ cm), perennial plants, diffusely branched pinnate leaves, elliptical to obovate, 12 or more leaflets. Flowers arranged in racemes which tend to be in groups of three at a node. Principal lateral branches (peduncles) accompanied by an auxiliary branch which is sometimes a naked peduncle. Blooms in May; fruits in June and July (Barneby 1949).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Private, BLM

REMARKS: Original population found on disturbed ground near Gunnison; a second population located by Barrell (Barrell 1969) at the base of cliffs in the drainage of South Beaver Creek.

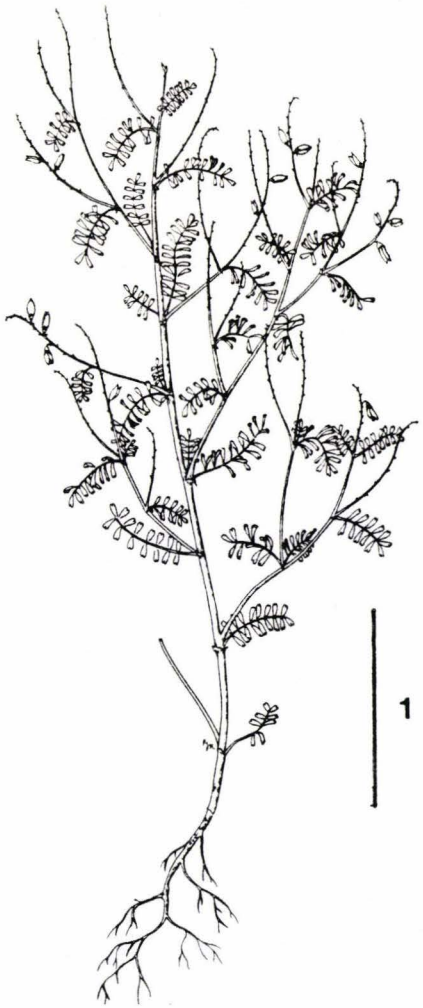
Additional Comments on Astragalus microcymbus:

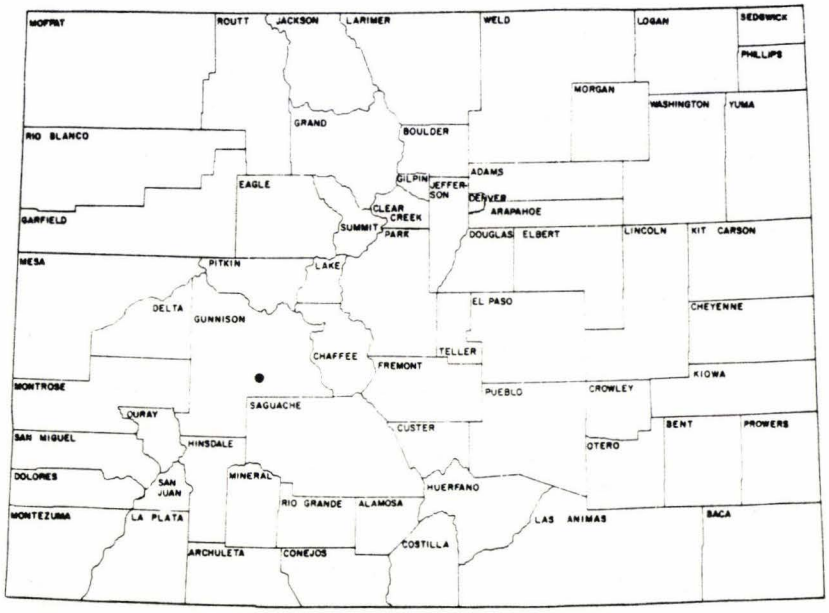
This species is now known from two populations. One of these, the one from which the original (type) specimens were taken, is very small and stands very close to a highway; several botanists have concluded that it is adventive there (see discussion in Barneby 1964). The other population is known from about 4 mi. to the southeast, and is apparently native, healthy, and large-sized. Even though the first named population is probably Endangered, the second population is apparently doing well in spite of heavy grazing. In fact, the plants are heavily browsed in the early spring when they are eaten back almost to the ground; however, these plants undergo a resurgence of growth, culminating in profuse flowering and fruiting in July when there is other forage available for grazing animals. This species, on the basis of preliminary, subjective evidence, appears to benefit by heavy grazing. Nonetheless, it is a very restricted species in geographical extent; although it might be found in a few other sites in the future, it is expected to remain small in number of populations.

Astragalus microcymbus
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

Astragalus microcymbus





FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus naturitensis Payson

ORIGINAL DESCRIPTION: Payson, Bot. Gaz. 60:377. 1915.

COMMON NAME(S): Naturita milkvetch

KNOWN DISTRIBUTION: Montrose (Dolores River) and Montezuma (McElmo Creek) Counties.

HABITAT: "Sandstone ledges and crevices of rimrock pavement along canyons, with juniper and pinon, 5400-6200 feet." (Barneby 1964).

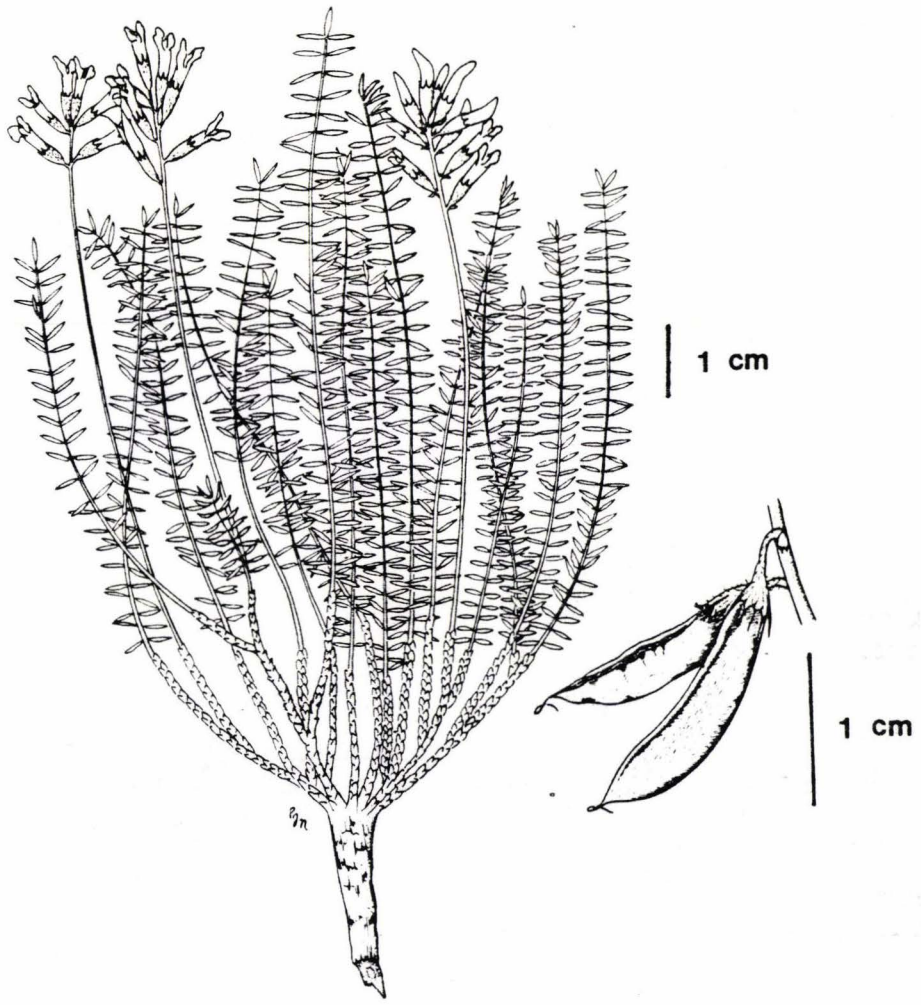
DESCRIPTION: Low growing (about 10 cm) spreading perennial plants with pinnate leaves. Flowers bicolored with white banners and reddish wings and keels, 14-15 mm long, calyx cylindric and 6-8 mm long. A. deterior is a similar species but has smaller, entirely yellowish-white flowers. Pods leathery, heavily covered with short, stiff, appressed hairs. Stipules large and conspicuous, 3-7 mm long, 2-5 mm wide (Barneby 1948).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: NPS, BLM

REMARKS: "Local, and apparently rare." (Barneby 1964).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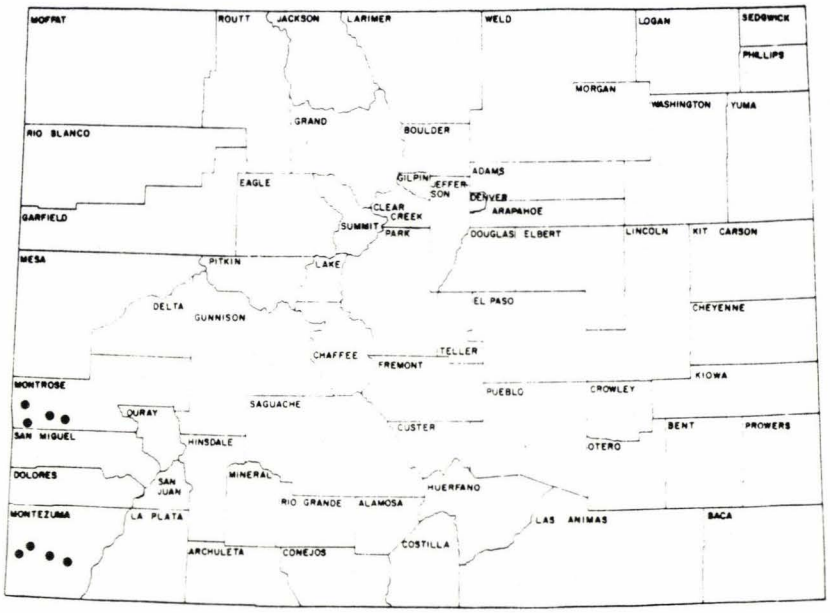
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FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus osterhoutii M. E. Jones

ORIGINAL DESCRIPTION: M. E. Jones, Rev. Astragalus 251. 1923.

COMMON NAME(S): Osterhout milkvetch

KNOWN DISTRIBUTION: Grand County, near Kremmling & Hot Sulphur Springs. Representative locality: T 1N, R 78W.

HABITAT: "Forming colonies along gulches in denuded clay hills, on barren knolls and at the foot of gullied bluffs, in stiff alkaline clay or shaley clay soils, sometimes growing up through sagebrush, 7500-7700 feet." (Barneby 1964). Adapted to soils rich in selenium.

DESCRIPTION: Tall (50-100 cm) rushlike perennial plants branching from a woody caudex. Linear, pinnate leaves have 9-13 leaflets, each 1.5-3.0 cm long. Flowers white or cream colored, 18-20 mm long, occurring in racemes. Pods linear; dorsally compressed making a cross section of the pod rhombic to elliptical; sutures prominant but not intruded; 2.5-4 cm long with many seeds per pod. Flowers in June and July (Harrington 1964). Flowering and fruit: June-August.

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

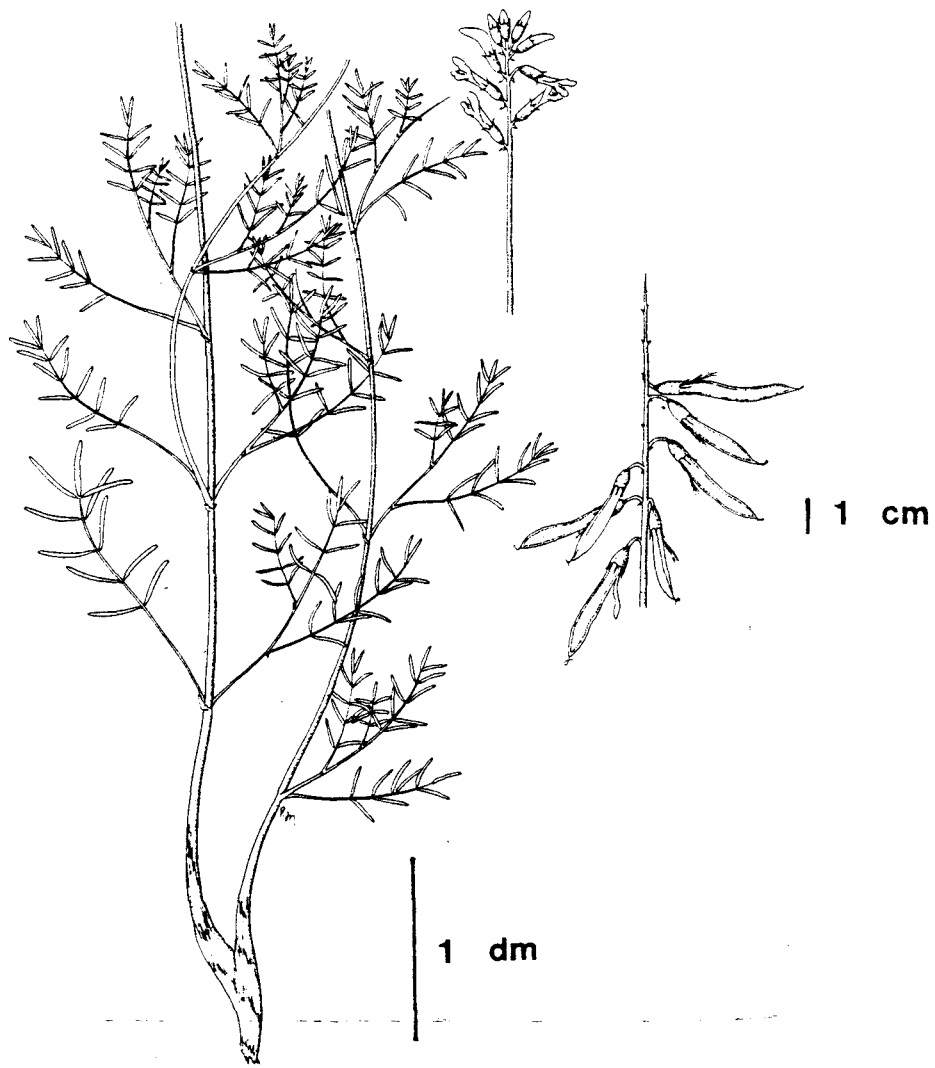
LAND OWNERSHIP/MANAGEMENT: BLM and private

REMARKS: "The Osterhout milkvetch is very local; its known range being restricted to an area not much over fifteen miles in diameter." (Barneby 1964).

Additional Comments on Astragalus osterhoutii:

This species is known from three or four populations in western Grand County, Colorado, on grayish-brown clay derived from Niobrara shale. The populations are small to medium-sized. No Threats have been seen to these populations, but they should be carefully watched since the species is very restricted locally. The population where this species was first discovered (the type locality) has not been seen in recent years but was supposed to be "four miles below Sulphur Springs." All the populations seen in recent years have been west of Kremmling.

Land Ownership/Management: Bureau of Land Management, private.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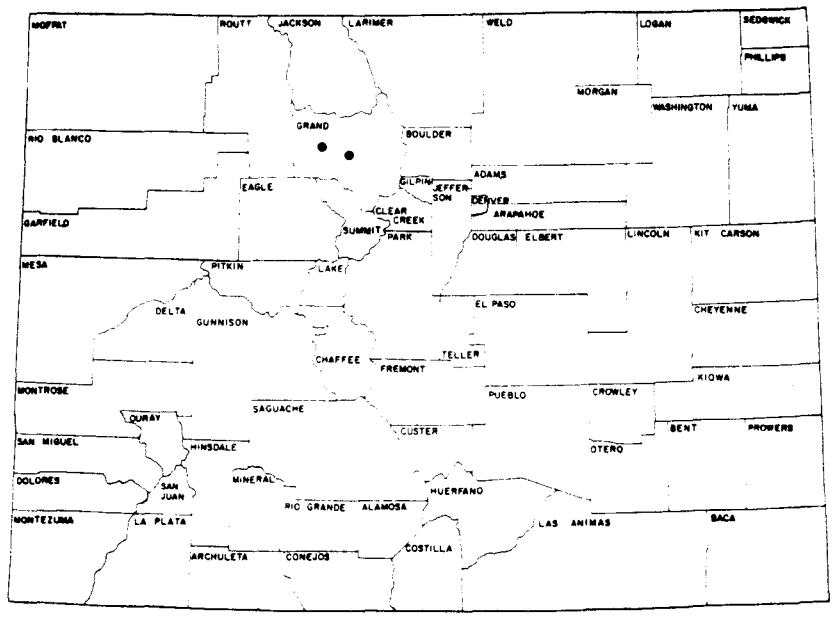
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FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus schmollae C. L. Porter

ORIGINAL DESCRIPTION: C. L. Porter, Madrono 8:100, Tab. 9, Fig. 4-7. 1945.

COMMON NAME(S): Schmoll milkvetch

KNOWN DISTRIBUTION: Montezuma County, Mesa Verde National Park.

HABITAT: On dry mesas in sandy loam (loess) soil; pinyon - juniper forest with Poa fendleriana; 6000-8000 feet.

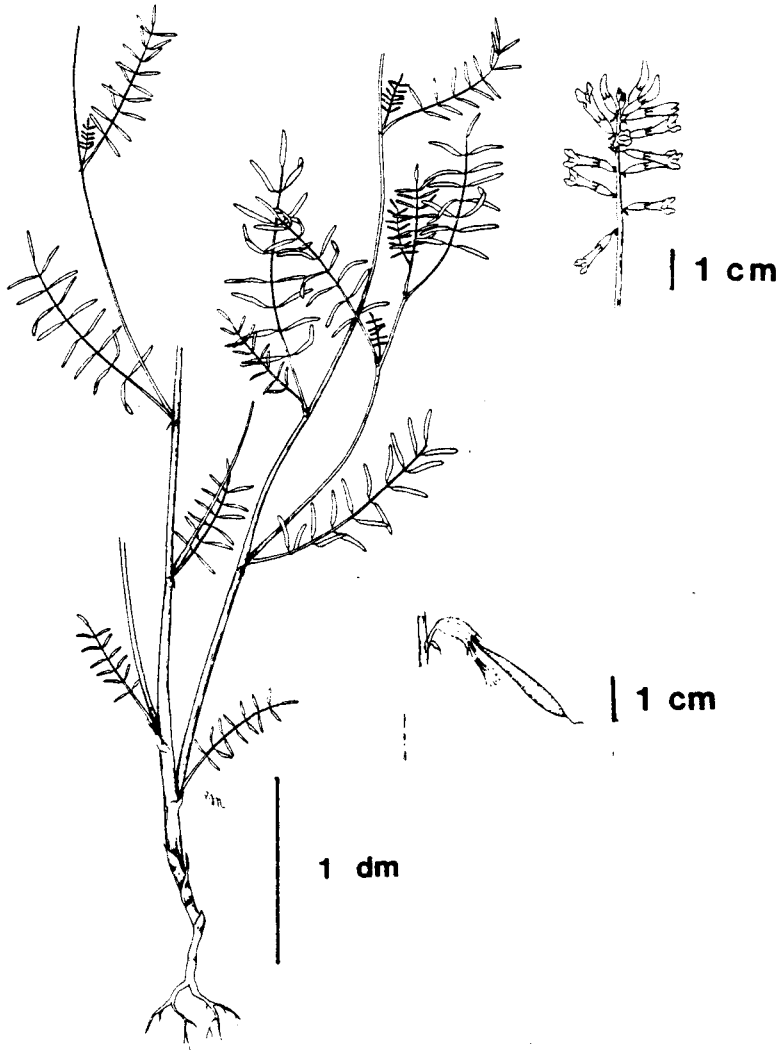
DESCRIPTION: Stems purplish below, green above, tall (45-60 cm), branching from the base, with short, stiff appressed hairs on the foliage. Leaves pinnate with 11-13 linear leaflets, 1-2 mm wide, 1-3 cm long. Flowers yellowish-white or cream colored, 12-13 mm long, subtending bracts (calyx) have black hairs. The distinguishing characteristic is the leathery pod. Pod almost straight when immature, but at maturity the lower (dorsal) suture is concave, and the upper (ventral) suture is convex, making the pod curve downward. Pod 25-40 mm long, 3-4 mm wide, obcordate in cross section, without an internal septum, 10-15 seeds per pod. Flowering: May; Fruit: June (Porter 1945).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: NPS

REMARKS: "Known range of the species extends little over a mile or possibly two in diameter, but the plants are abundant locally in gravelly openings among the nut Pinyon and junipers." (Barneby 1964).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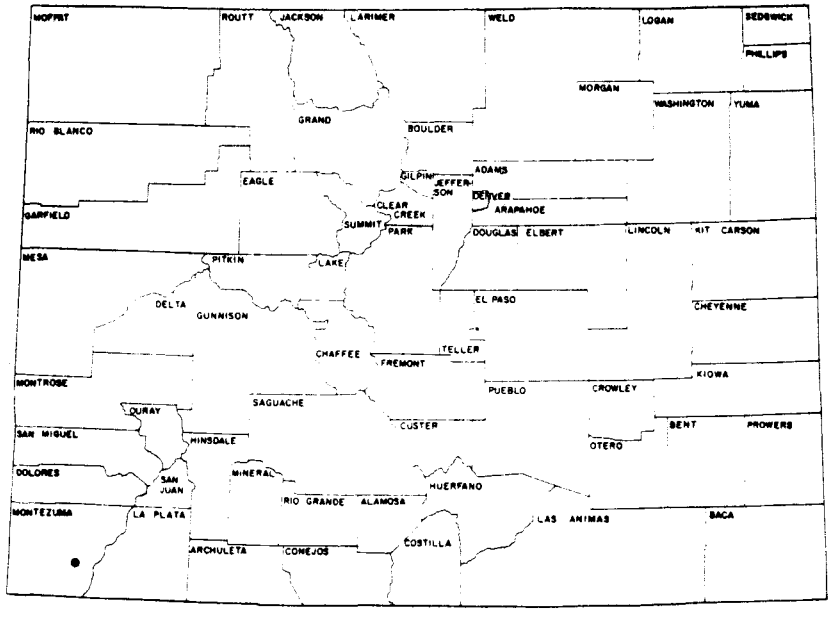
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FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Astragalus wetherillii M. E. Jones

ORIGINAL DESCRIPTION: Jones, Zoe 4:34. 1893.

COMMON NAME(S): Wetherill milkvetch

KNOWN DISTRIBUTION: Garfield and Mesa Counties (along the Colorado and Lower Gunnison Rivers).

HABITAT: In dry soil of west facing slope; with pinyon, juniper, and sagebrush; 4500-6000 feet.

DESCRIPTION: Short-lived perennial with slender taproot and superficial root-crown; stems 5-10, decumbent and ascending, .4-2.4 dm long, purplish at base, thinly strigulose with fine, straight appressed hairs up to .3-.45mm long. Leaves 3.5-10cm long with slender petioles and 7-15 broadly obovate or oval, obtuse flat, thin textured leaflets 5-14mm long; racemes loosely 2-9 flowered; pedicels at anthesis ascending, calyx campanulate 2.8-3.6mm long; petals whitish to purplish tinged; pod loosely spreading or declined, obliquely ovoid-ellipsoid 1.4-2cm long, 6-10mm wide, inflated, shallowly grooved along one or both sutures, the thin greenish, often purple speckled, minutely strigulose valves becoming papery, stramineous or brownish, ovules 9-13; seeds brown, 2.4-2.7mm long. Useful field characters are the few, small white or whitish flowers, its few (3-7) pairs of broad, thin textured leaflets, and its obliquely ovoid pods elevated out of the calyx on a short but evident gynophore (Barneby 1964).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM and private land

REMARKS: "Rare and local." (Barneby 1964).

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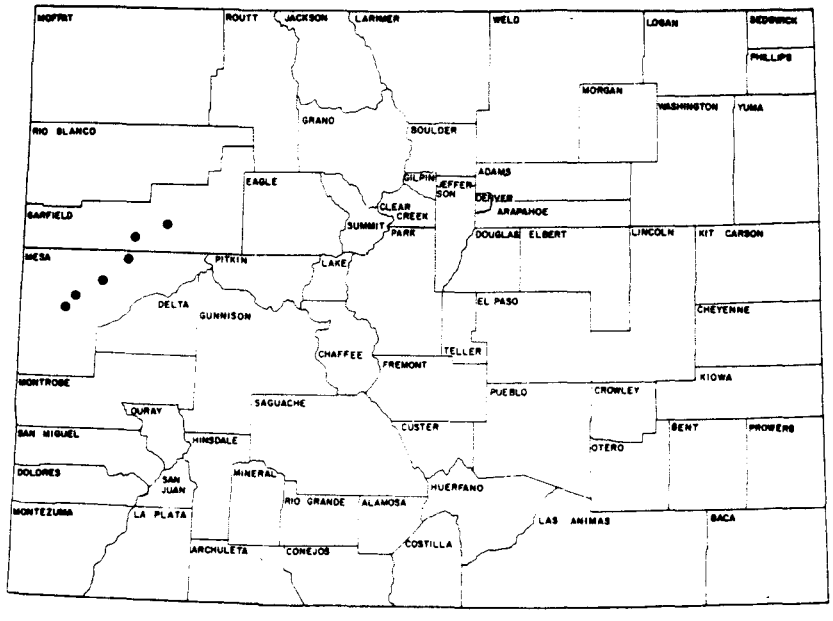
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FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Oxytropis obnapiformis C. L. Porter

ORIGINAL DESCRIPTION: C. L. Porter, Madrono 9:133, Fig. 1947.

COMMON NAME(S): Locoweed

KNOWN DISTRIBUTION: Moffat County (vicinity Maybell); Utah and Wyoming.
Representative locality: T 6N, R 96W.

HABITAT: On sand dunes and Browns Park formation outcrops; 5900 feet.

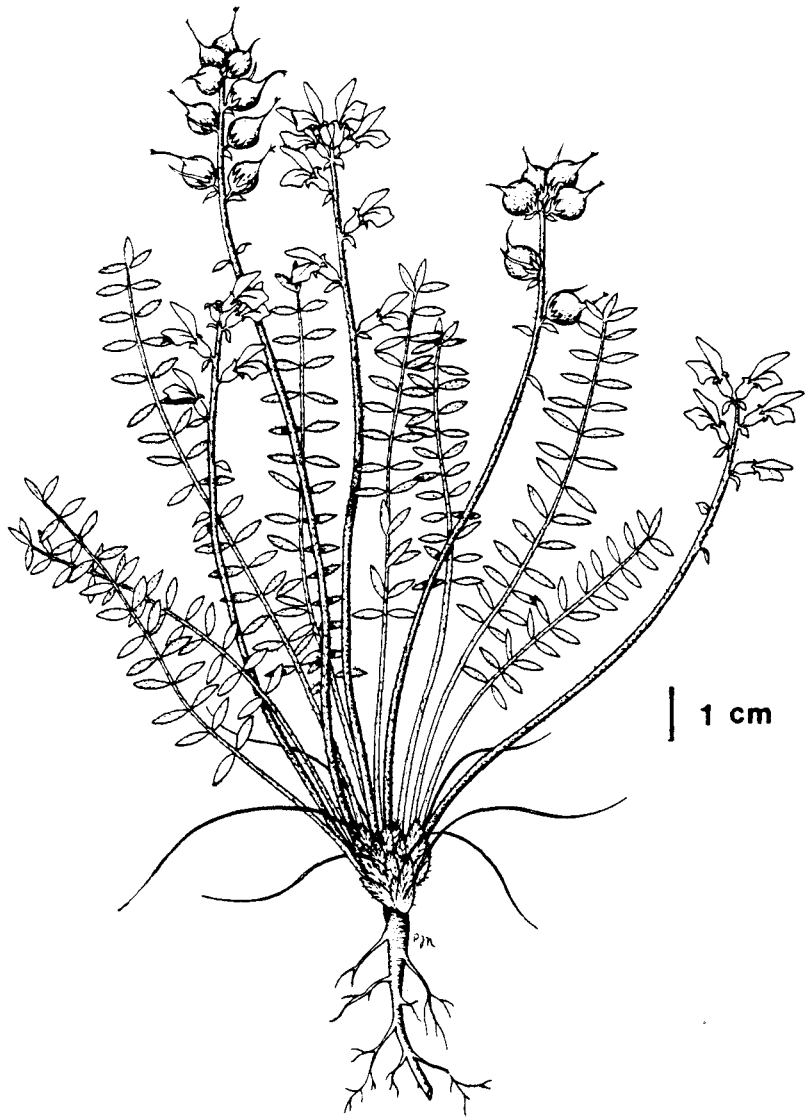
DESCRIPTION: Grayish perennial plant, 1-3 cm high, from silky caudices. Leaves pinnately arranged with 11-25 oblong-lanceolate leaflets, which are also grayish due to appressed, silky hairs. Flowers purplish (banner with white center and purple margin), 15-20 mm long. The most distinguishing feature, the mature pod, is turnip-shaped and has a thin, papery texture (Porter 1947). Flowering: late May, early June.

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Probably BLM

REMARKS: None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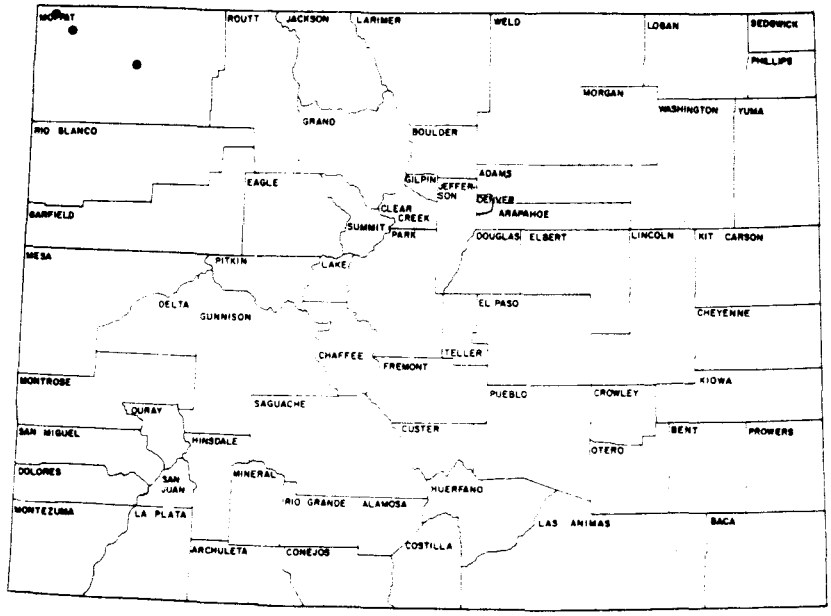
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FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME: Trifolium lemmonii Wats.

ORIGINAL DESCRIPTION: Watson, Proc. Am. Acad. Sc., Vol. 11, 1876. p. 127. Also as T. gymnocarpon var. lemmonii McDermott, Illustrated Key to North American Trifolium. Vol. 194. 1910. Plate 78.

COMMON NAME(S): None

KNOWN DISTRIBUTION: California, Sierra County to Lassen Peak, western Nevada.

HABITAT: Yellow pine, sagebrush scrub.

DESCRIPTION: Strigose perennial from a deep taproot and slender stems 1.5-2 dm high; stipules ovate, coarsely few toothed, to 1 cm long; leaflets 4-6, obovate, obtuse mucronate, coarsely toothed, 6-12 mm long, peduncles 5-12 cm long, far surpassing leaves, heads 1.5-2 cm broad, many flowered; the rachis swollen; pedicels reflexed in age, 1-2 mm long, calyx curved at base, corolla bright yellow, 1 cm long. Pods somewhat pubescent (Munz and Keck 1959).

TAXONOMIC PROBLEMS: Not know from Colorado. T. lemmonii was once considered a subspecies of T. gymnocarpon, a species common in Colorado.

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

REMARKS: This species should be deleted from the Colorado list.

FUMARIACEAE

SCIENTIFIC NAME: Corydalis caseana A. Gray ssp. caseana G. B. Ownbey

ORIGINAL DESCRIPTION: Gray Proc. Am. Acad. 10:69. 1874; G. B. Ownbey, Ann. Mo. Bot. Gard. 34:201. 1947.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Northern California; never reliably reported in Colorado.

HABITAT: Very moist, often shady places--springs and on gravel bars in and along streams.

DESCRIPTION: Perennial; 50-100 cm tall, with pinnate leaves which have elliptical leaflets 1-2 cm long. Plants are covered with a whitish or bluish waxy covering, which usually rubs off. Flowers light pink or white, often curved; 11 petals, two outer spreading with one spurred at the base, two inner ones which are smaller and narrower and united at the reddish-purple apex. Stamens in 2 sets of 3 each (diadelphous). The best distinguishing features to look for are the narrow or absent wing margin, the narrower curved spurred petal, and the acute tips of the outer petals. Subspecies caseana is similar to ssp. brandegei (Wats.) G. B. Ownbey, but a smaller plant, with smaller flowers, and narrower petal margins (Ownbey 1947).

TAXONOMIC PROBLEMS: Corydalis caseana brandegei occurs in Colorado; ssp. caseana does not.

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

REMARKS: Should be deleted from Colorado list

HYDROPHYLLACEAE

SCIENTIFIC NAME: Phacelia formosula Osterhout

ORIGINAL DESCRIPTION: Osterhout, Bull. Torr. Bot. Club 46:54. 1919.

COMMON NAME(S): Phacelia

KNOWN DISTRIBUTION: Jackson County

HABITAT: Loose sandy soil at an elevation of 8300 feet (Atwood 1975).

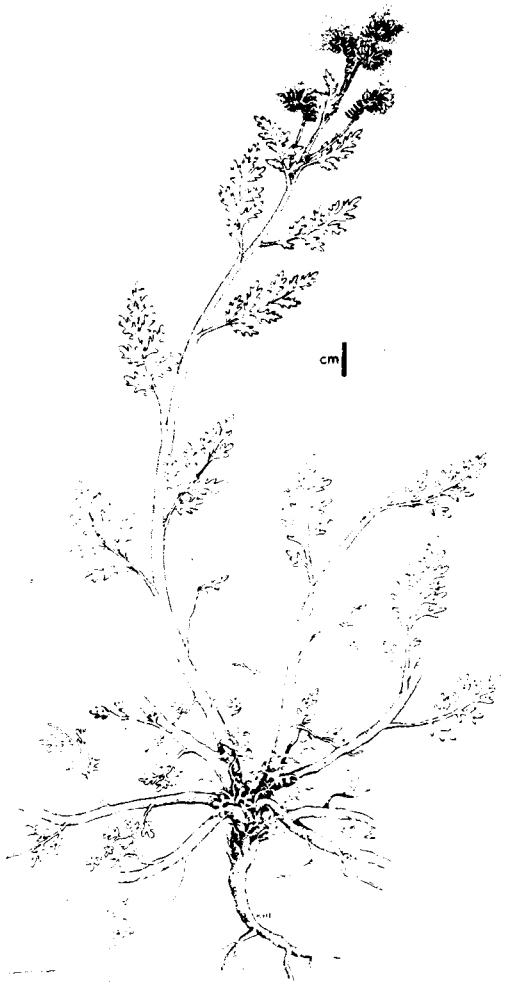
DESCRIPTION: Biennial; 1.5-2 cm high, with a single, upright stem or sometimes branched from the base. Stems densely pubescent with stiff, rigid, bristle-like hairs. Leaves lanceolate or narrowly ovate, pinnate, with leaflets 5-10 mm long, 3-5 mm wide. Inflorescence scorpioid, 3-5 cm long, with blue or violet campanulate flowers in 2-ranked racemes; filaments and style are rounded on the back, with a ridge lengthwise through the middle of the ventral side (not transversely corrugated). P. glandulosa is a similar species, but has larger leaves, rougher pubsecence, and wider calyx lobes. Flowers in August (Osterhout 1919).

TAXONOMIC PROBLEMS: Atwood (1975) cites difficulties in distinguishing this species from P. glandulosa.

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM or private land, possibly U.S. Forest Service.

REMARKS: Recently rediscovered by Atwood (1975) in Jackson County.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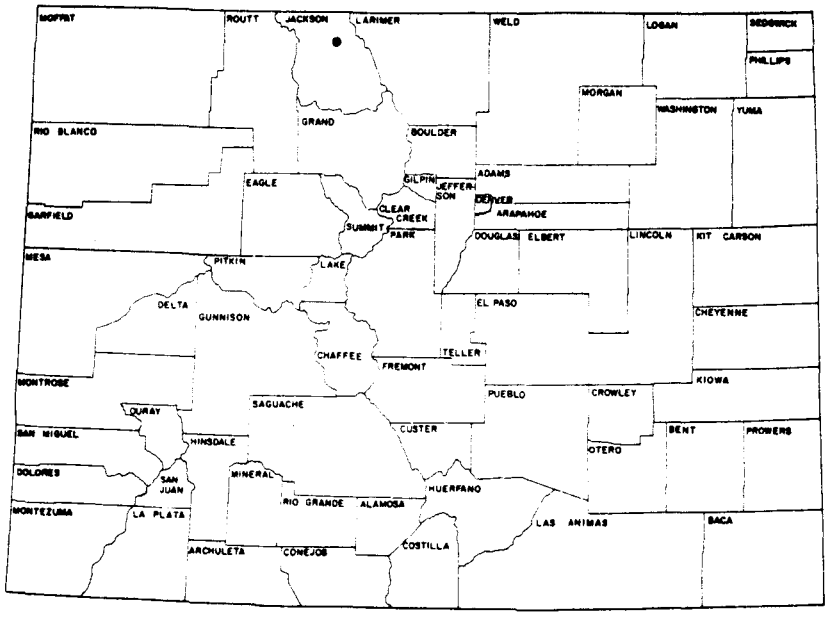
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HYDROPHYLLACEAE

SCIENTIFIC NAME: Phacelia submutica J. T. Howell

ORIGINAL DESCRIPTION: J. T. Howell, Proc. Cal Acad. Sci. 25:370. 1944.

COMMON NAME(S): Phacelia

KNOWN DISTRIBUTION: Mesa County, vicinity of Debeque.
Representative locality: T 8S, R 96W.

HABITAT: Seleniferous knolls (gumbo clay hills) on dry ground; 4700-5000 feet.

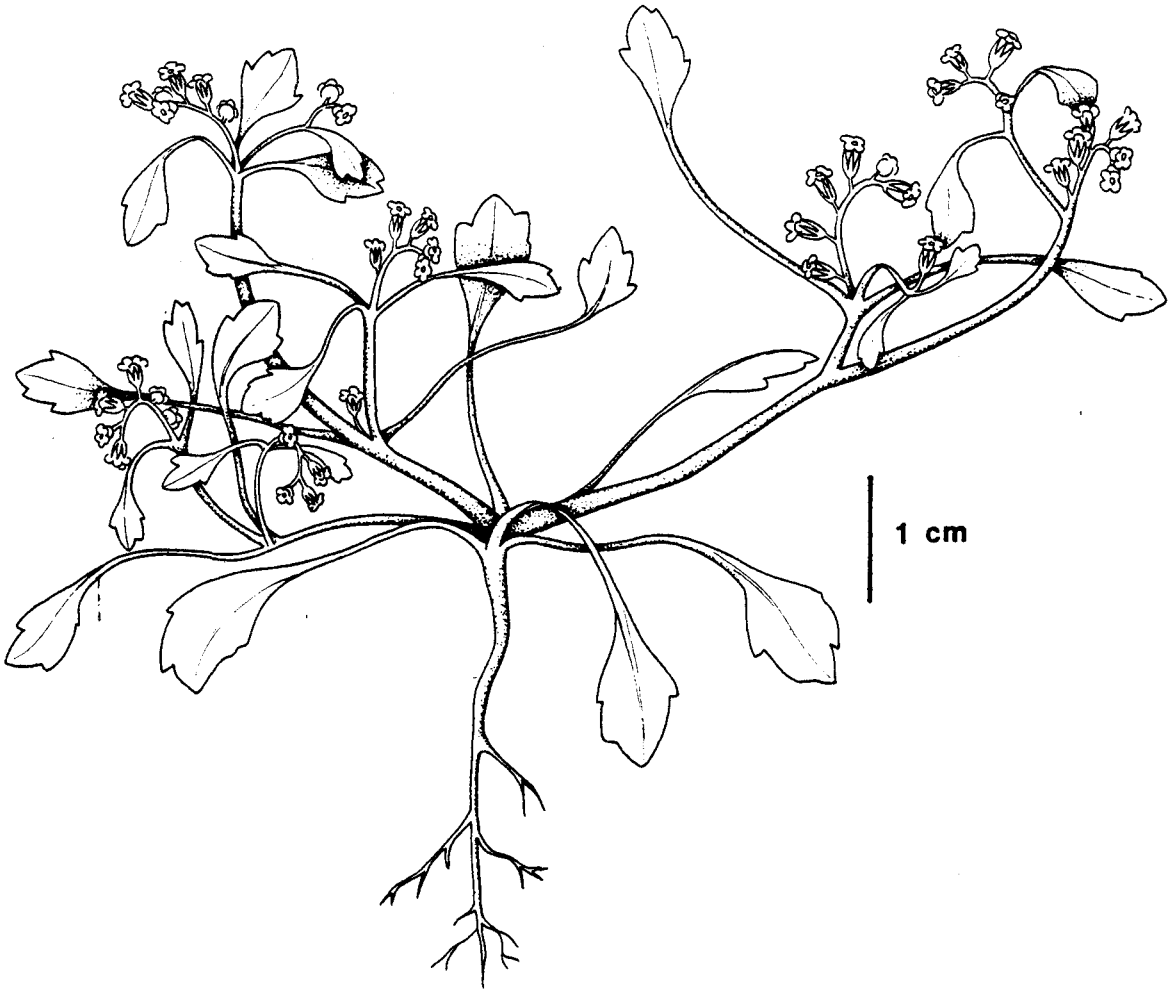
DESCRIPTION: Annual plant of xeric sites, branched at the base with stems 2-8 cm tall which are covered with inconspicuous long, soft, straight. hairs. The entire to serrate-lobed leaves have coarse, stiff hairs. Stamens included in light yellow flowers, 3.5-4.5 mm long. Seeds ovate with 6-12 transverse corrugations (Howell 1944).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Only two small populations are presently known and each are threatened by grazing animals, motorcyclists.

LAND OWNERSHIP/MANAGEMENT: BLM and private

REMARKS: None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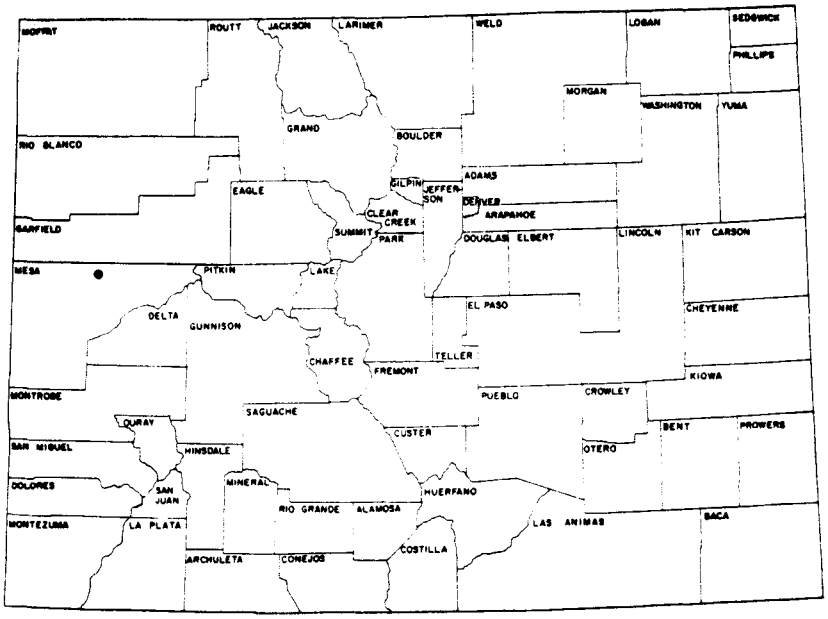
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GILPIN
JEFFERSON
ADAMS
DENVER
ARAPAHOE
EAGLE
CLEAR CREEK
GARFIELD
SUMMIT
PARK
DOUGLAS
ELBERT
LINCOLN
KIT CARSON
MESA
PITKIN
LAKE
EL PASO
CHEYENNE
DELTA
GUNNISON
CHAFFEE
TELLER
FREMONT
KIOWA
MONTROSE
PUEBLO
CROWLEY
SAGUACHE
OURAY
CUSTER
BENT
PROWERS
SAN MIGUEL
HINSDALE
OTERO
DOLORES
SAN JUAN
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RIO GRANDE
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BACA
MONTEZUMA
LA PLATA
COSTILLA
ARCHULETA
CONEJOS

ONAGRACEAE

SCIENTIFIC NAME: Gaura neomexicana Wooton ssp. coloradensis (Rydb.) Raven & Gregory. 1938.

ORIGINAL DESCRIPTION: As Gaura coloradensis Rydb. Bull Torrey Bot. Club 31:572 1904; Raven and Gregory Mem. Torrey Bot. Club 23:63. 1972.

COMMON NAME(S): Gaura

KNOWN DISTRIBUTION: Larimer, Weld, and Douglas Counties. Not recently found in Douglas County; recently rediscovered in southern Wyoming (R. Dorn, Wyoming Department of Environmental Quality).

HABITAT: Humic soil in wet areas and bottoms of drainages; 5000-6000 feet.

DESCRIPTION: Biennial or perennial; with one to several erect stems, from woody roots; 40-70 cm tall. Leaves alternate, lobeless, narrow and 5-10 cm long. Flowers pink, turning rose, with petals 8-10 mm long, sepals 9-11 mm long and linear anthers. The pubescence and the geographic distribution distinguishes this variety from the typical subspecies. Variety coloradensis is found in the northern part of the state, and the typical subspecies is found in the southern part of Colorado and New Mexico. Flowers in July (Munz 1938).

TAXONOMIC PROBLEMS: Gaura neomexicana complex needs further study (Johnston, personal communication).

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Private and possibly USFS

REMARKS: Possibly extirpated from Colorado (Robert Dorn, personal communication).

Additional Comments on Gaura neomexicana ssp. coloradensis:

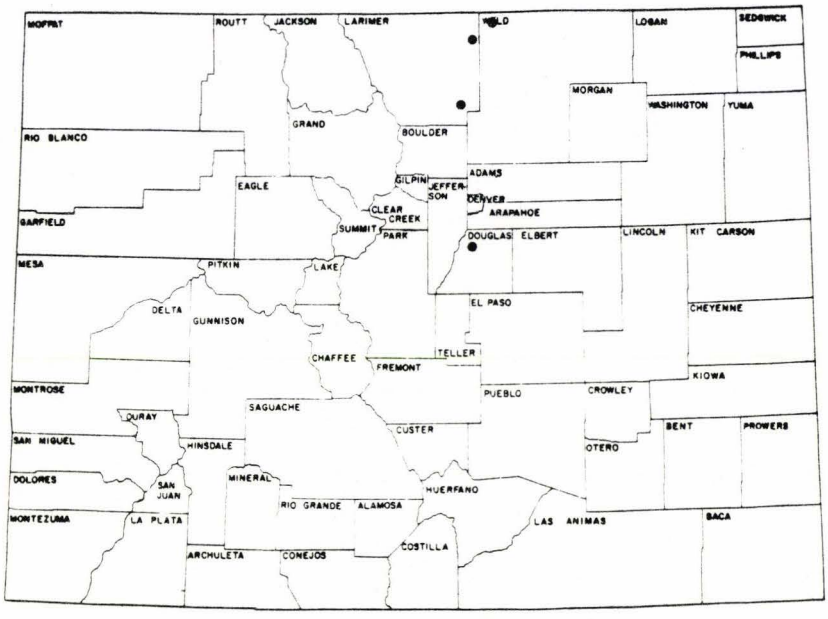
This subspecies (the discussion on page 83 mixes the words "subspecies" and "variety") has not been seen in Colorado since 1964. It was recently rediscovered in Wyoming just north of Colorado in a creek bottom at the transition between the bottomland grasses and the upland dry-site grasses and forbs.

The ecology of this subspecies is poorly understood; the plants have disappeared from several sites without apparent reason. This situation needs to be investigated further.

Gaura neomexicana var. coloradensis
U.S.D.A. Forest Service

Herbarium Specimen in herbarium of Univ. of Wyoming, The Rocky Mountain Herbarium. Photo in R-2 Library.

1 dm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MONTROSE
PUEBLO
CROWLEY
OURAY
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CUSTER
BENT
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MINERAL
HUERFANO
RIO GRANDE
ALAMOSA
MONTEZUMA
LA PLATA
LAS ANIMAS
BACA
ARCHULETA
CONEJOS
COSTILLA

POACEAE (GRAMINEAE)

SCIENTIFIC NAME: Festuca dasyclada Hack.in Beal

ORIGINAL DESCRIPTION: Hack. in Beal, Grasses of North America 2:602. 1896.

COMMON NAME(S): Fescue grass

KNOWN DISTRIBUTION: Garfield County, Roan Plateau; also in Utah.

HABITAT: Rocky slopes

DESCRIPTION: Culms 20-40 cm tall. Leaf blades of culm folded, 2 mm wide, 4-6 cm long; blade near the base 10-15 cm long. Panicle open, 7-12 cm long; stiff; softly pubescent; divaricate. Spikelets pale; long-pediceled, 2-flowered. Glumes lanceolate, acuminate; the first about 4 mm long, the second about 6 mm long. Lemmas thin; somewhat keeled; strongly nerved; 6 mm long; awn 2 mm long from between 2 minute teeth (Hitchcock & Chase 1950).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Private, BLM

REMARKS: Recently rediscovered, but inadequate field collections to determine current distribution.

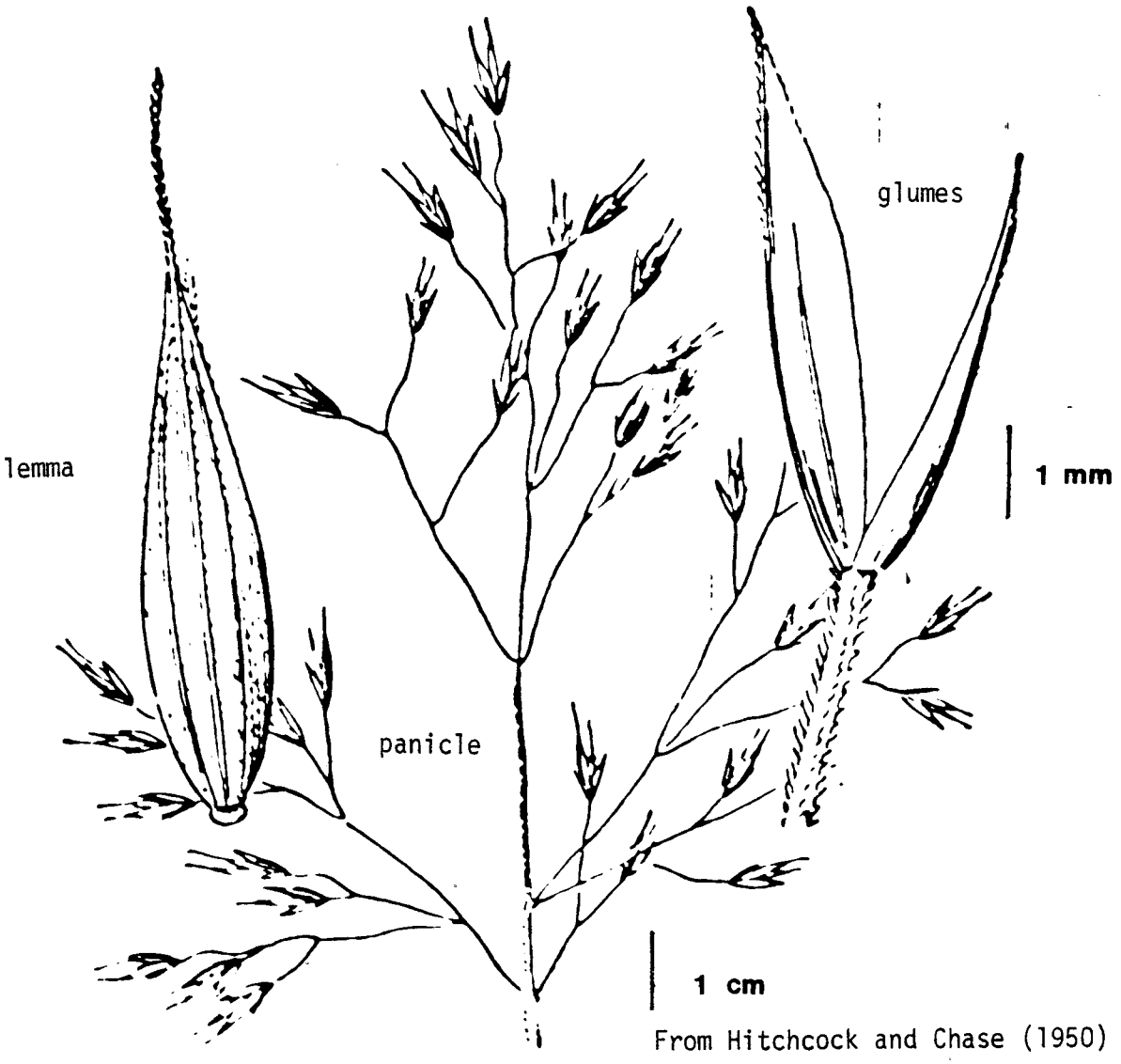
Additional Comments on Festuca dasyclada:

This species has been recently seen in several populations, all in central Garfield County, Colorado. Two of these number over 500 individuals and no Threats seem to be present. It was growing in dry, rocky talus slopes, and also in damp gully bottoms where the panicles were more compact than on the dry slopes.

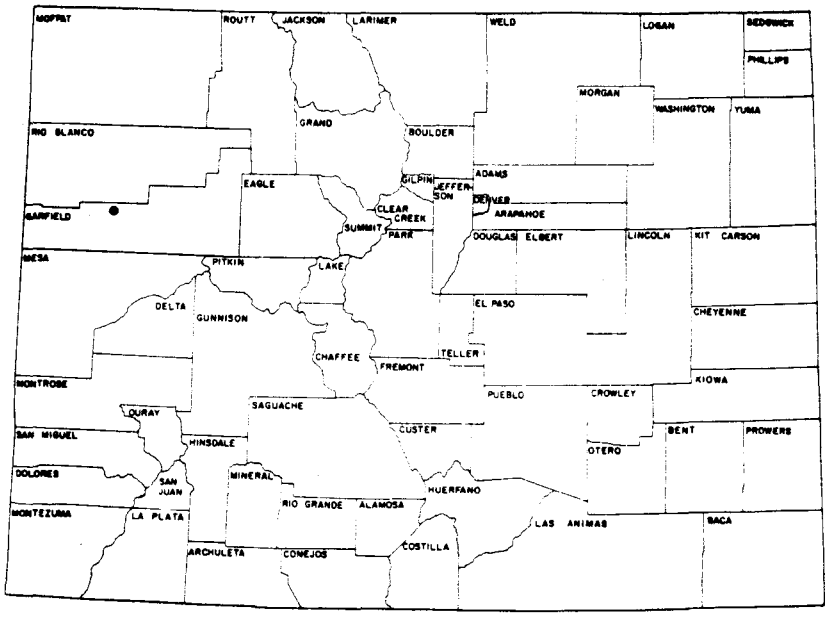
Several botanists are of the opinion that this species belongs in some other genus besides Festuca; it is not certain which genus is proper.

Land Ownership/Management: Bureau of Land Management (Grand Junction District), private.

Festuca dasyclada



From Hitchcock and Chase (1950)



POACEAE (GRAMINEAE)

SCIENTIFIC NAME: Phippsia algida (Phipps) R. Br.

ORIGINAL DESCRIPTION: Phipps, Chlor. Melv. 27, 1823.

COMMON NAME(S): Icegrass

KNOWN DISTRIBUTION: Boulder, Clear Creek, Summit and Lake Counties, southern part of the east slope of Tenmile range, also in the Front Range (Boulder Co.); Representative locality: T 5S R 74W; Also in NW Wyoming and Alaska.

HABITAT: Wet sand and gravels of slow streamlets, snow beds, mostly in tundra; 12,300-14,000 feet.

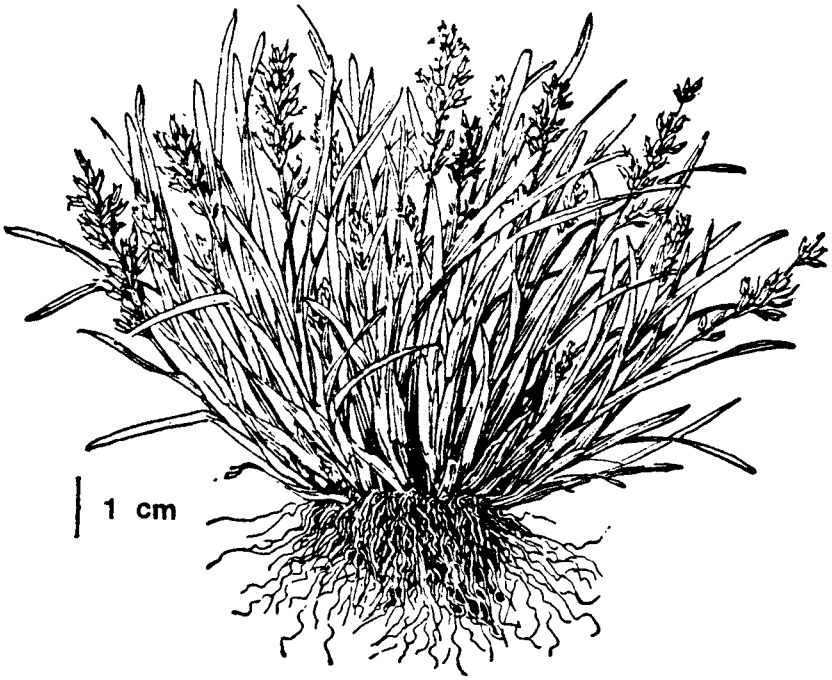
DESCRIPTION: Densely tufted, greenish-yellow plants with more or less decumbent culms, 2-10 cm tall. Leaves flat, shorter than culms. Panicles narrow, up to 4 cm long, contracted. Spikelets 1- flowered, about 1 mm long, greenish-yellow, or sometimes purplish, with a glabrous or very faintly pubescent lemma. Fruit broadest above middle (Hulten 1968).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: USFS, BLM

REMARKS: Widely scattered across high mountains in Front Range and central mountains of the state. Considered rare because of its inconspicuousness.

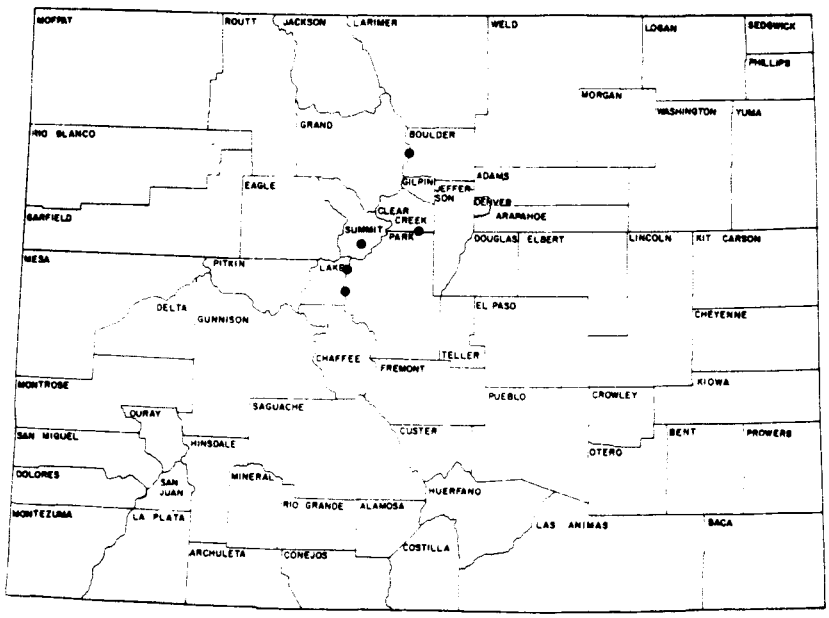


floret

1 mm

glume

From Hitchcock and Chase (1950)



POLYGONACEAE

SCIENTIFIC NAME: Eriogonum brandegei Rydb.

ORIGINAL DESCRIPTION: Rydberg, Fl. Rocky Mts. 220, 1061. 1917.

COMMON NAME(S): Brandegee buckwheat

KNOWN DISTRIBUTION: Park, Chaffee County (vicinity Arkansas River).
Representative locality: T 51N, R 8W.

HABITAT: Claybanks and flats

DESCRIPTION: Plant covered with loose tufts of woollike hair, not uniformly over all surfaces (floccose). Leaves narrowly oblanceolate, white-tomentose beneath, floccose above. Inflorescence on naked flowering stem (no leaves), 10-20 cm tall; globular or head-shaped cluster; with awl-shaped bracts, occasionally elongated. Flowers rose-colored; 3 mm long; petals squared at apex or with a notch. Fruit glabrous (Rydberg 1917).

TAXONOMIC PROBLEMS: None known

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Probably private

REMARKS: Infrequent in Colorado herbaria.

Additional Comments on Eriogonum brandegei:

This species is now known from about six localities in Park, Chaffee and Fremont Counties, Colorado, where it usually forms bluish-green mats of foliage on fairly barren banks of pink or grayish clay, usually in sagebrush stands but often also in open Pinon-Juniper. The description given on page 89, after Rydberg, is essentially correct, but the more important characters are not given, so a more relevant description after Reveal (1969) follows:

> Low spreading herbaceous perennials 1-2.5 dm. high and 1.2 dm. across; leaves basal, the leaf-blades oblanceolate to elliptic, 1.5-3 (4) cm long, 4-8 mm wide, tomentose, the margins entire and plane, the petioles long, 1-1.5 cm long, tomentose; flowering stems erect, 1-2.5 dm. long, tomentose to floccose; inflorescences capitate or nearly so; bracts scale-like, ternate, 1-5 mm long, 0.5-1.2 mm wide; peduncles lacking or up to 3 mm long, thinly floccose to glabrous; involucres gongested, 4-8 per head, turbinate, 3.5-5 mm long, glabrous, the tepals essentially similar. Flowers from late June through mid-August, fruit from August through late September.

None of the populations surveyed so far show any Threats; so far they all have been in good health and of medium to large size.

Land Ownership/Management: Bureau of Land Management, perhaps private as well.

Eriogonum brandegei
U.S.D.A. Forest Service

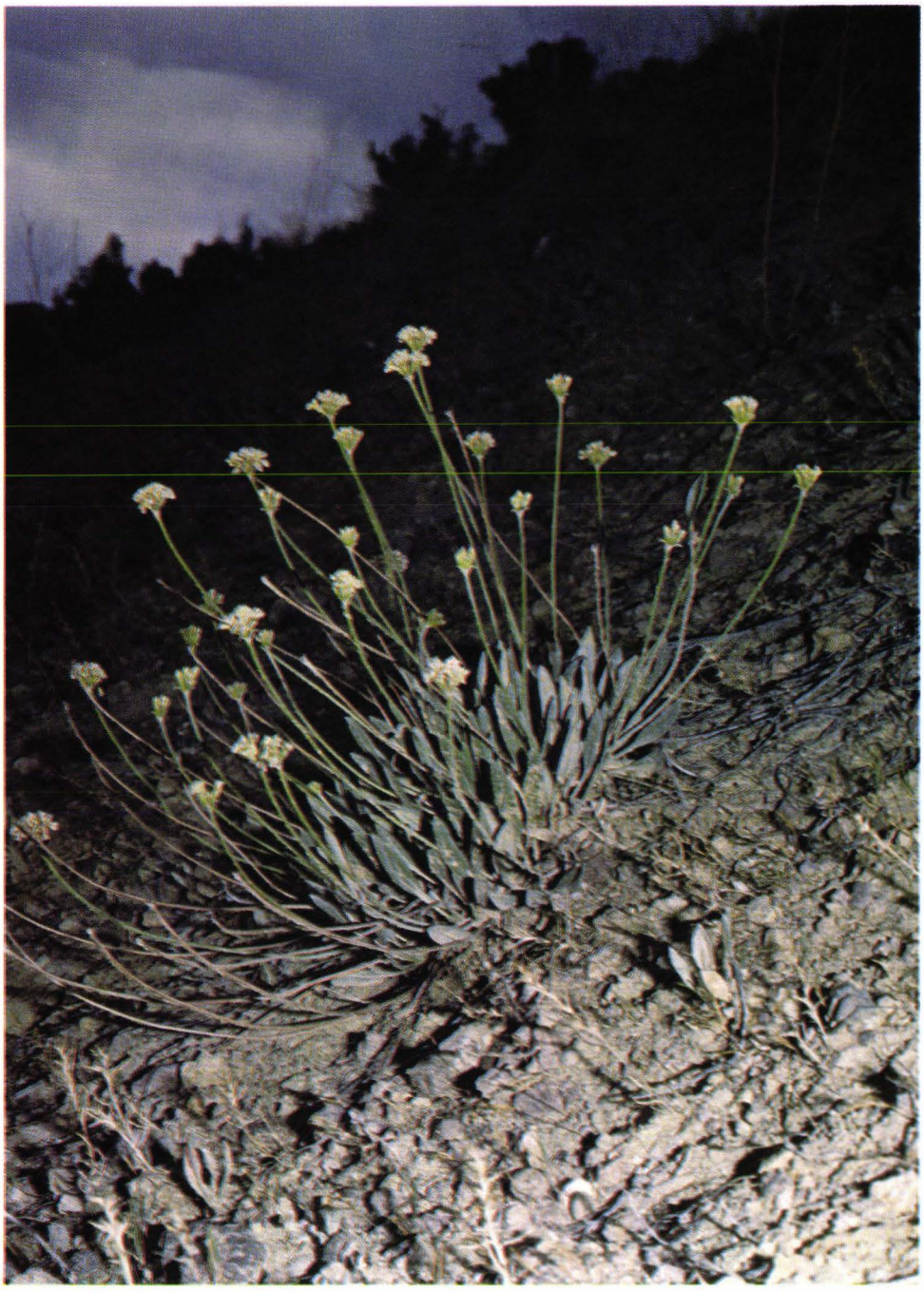
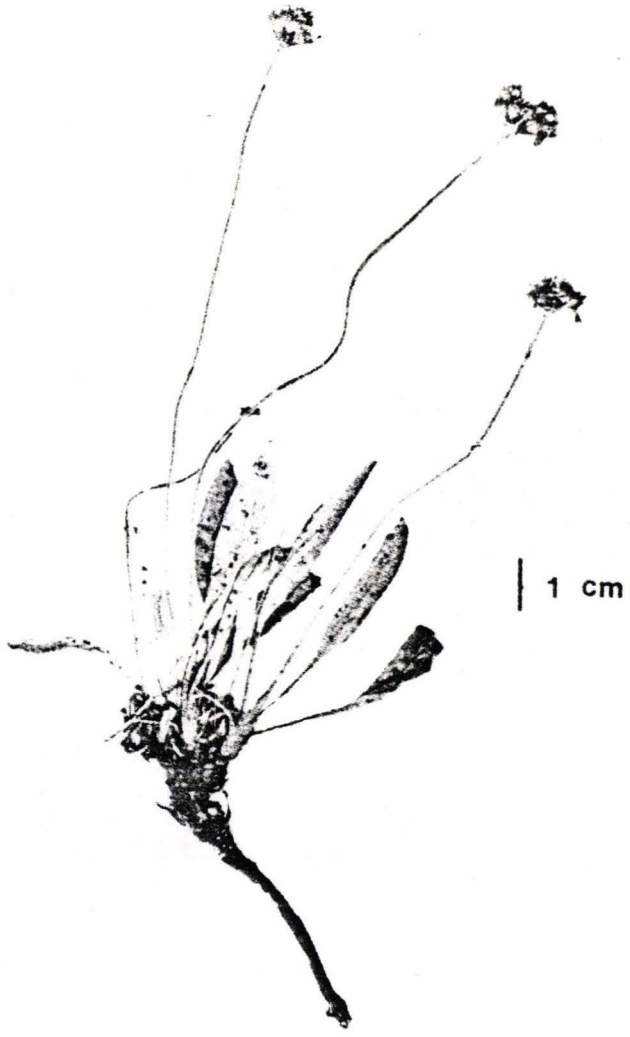
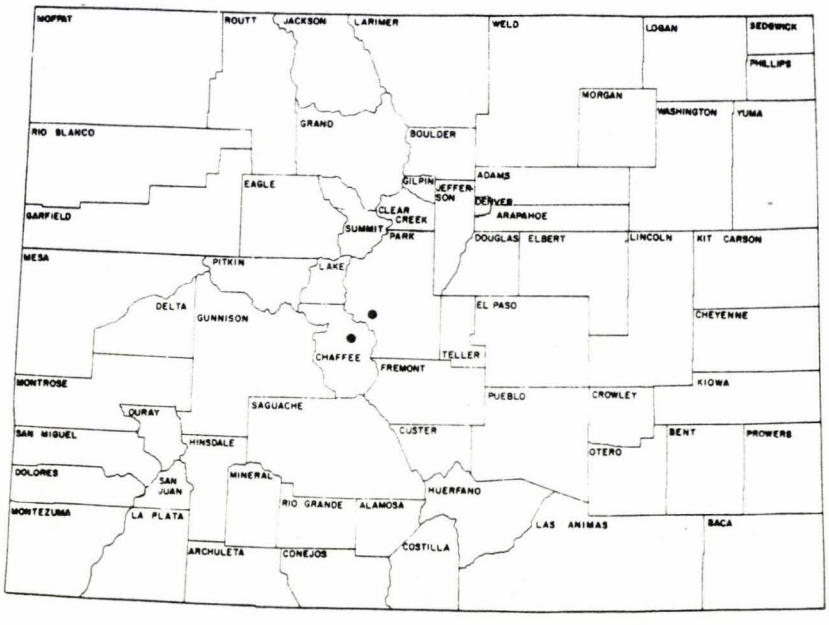


Photo in U.S.D.A. Forest Service R-2 Library





LIBRARY COPY
ROCKY MTN. FOREST & RANGE
EXPERIMENT STATION

POLYGONACEAE

SCIENTIFIC NAME: Eriogonum ephedroides Reveal

ORIGINAL DESCRIPTION: Reveal, Madrono 19:295. 1968.

COMMON NAME(S): Wild buckwheat

KNOWN DISTRIBUTION: Rio Blanco County; 17 miles northwest of Rangely; also on White River, Uintah County, Utah. Representative locality: T 3N, R 103W.

HABITAT: Light gray to white shale slopes; 5600 feet elevation.

DESCRIPTION: E. ephedroides plants are perennials, erect, and grow 2-3.5 dm high from gnarled, woody branching caudices. This species has a striking resemblance to Ephedra torryana S. Wats., and thus the name "ephedroides." All the leaves are basal, flat, lanceolate 1.5-2.5 cm long, 2-3 mm wide, with the bottom surface white-hairy, and the upper surface green. The stems are bright green with ternate, linear bracts, 1-4 mm long. The inflorescence is 3 branched at the first node, 2 or 3 branched above, and has lemon-yellow to yellow flowers. The achenes are brown, about 2 mm long, and have subglobose bases tapering to 3-angled beaks. This species resembles E. brevicaule var. leptothecum, but the leaves of E. ephedroides are wider, nonrevolute, and are a different size and shape. Variety leptothecum also is restricted to the Front Range of Colorado (Reveal 1968). Flowering: late July.

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Oil Shale Development

LAND OWNERSHIP/MANAGEMENT: Unknown, probably Bureau of Land Management

REMARKS: Recently described, distribution not well studied.

Additional Comments on Eriogonum ephedroides:

This species is now known from several populations in Colorado, all in far northwestern Rio Blanco County. These all are of medium to large size, and no Threats seem apparent. This species also occurs in a number of localities in Utah; Utah botanists have recommended its removal from the Federal Proposed List because of its abundance in Utah.

Land Ownership/Management: Bureau of Land Management, private.

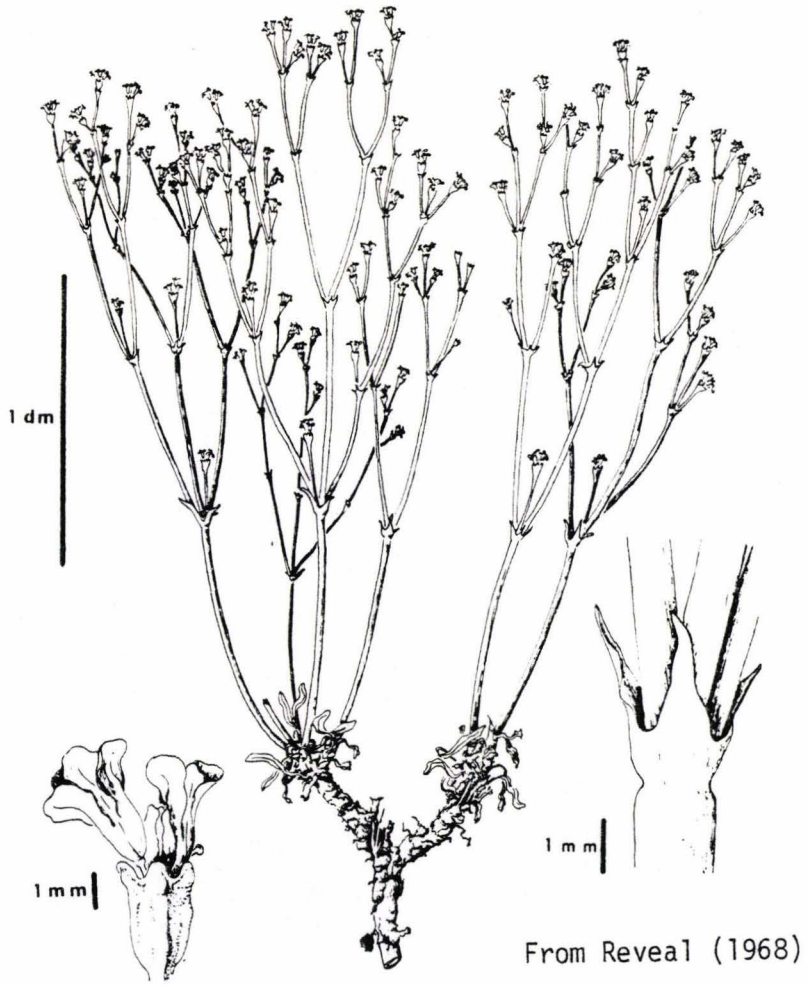
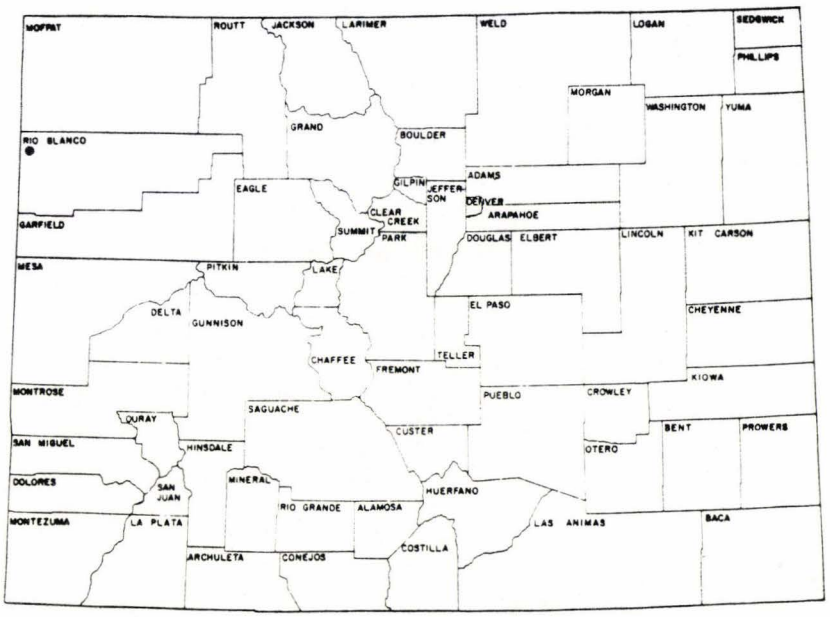


FIG. 4. *Eriogonum ephedroides*. Habit sketch showing the narrowly erect stems and arrangement of the basal leaves with an enlargement of a single involucre with exserted flowers and an enlarged section of the stem at the node showing the ternate bract.



POLYGONACEAE

SCIENTIFIC NAME: Eriogonum pelinophilum Reveal

ORIGINAL DESCRIPTION: Reveal, Great Basin Nat. 33:120. 1973.

COMMON NAME(S): Clay-loving buckwheat

KNOWN DISTRIBUTION: Delta County, west of Hotchkiss. Representative locality: T 14S, R 94W.

HABITAT: Gumbo clay hills; desert (associated with Eriogonum loncho-phyllum, Atriplex species.

DESCRIPTION: Subshrub which grows in close, thick mats (cushion plants) 5-10 cm high. Lower stems light brown, leafless, woody with bark pealing off in long, loose strips or in wide plates. Leaves oblance-olate; scattered along the length of the upper, herbaceous stems; densely white-hairy on bottom surface (midvein concealed by white hairs); upper surface is green. Flowers white to cream colored, 3-3.5 mm long, with reddish-brown midribs, and noticeably large brownish-red to greenish-red bases. Achenes light brown, 3-3.5 mm long, with globose bases which taper abruptly to a long, three-angled beak. E. pelinophilum separable from E. contortum by its white or cream colored flowers and longer involucres, flowers, and achenes (Reveal 1973).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Private, BLM

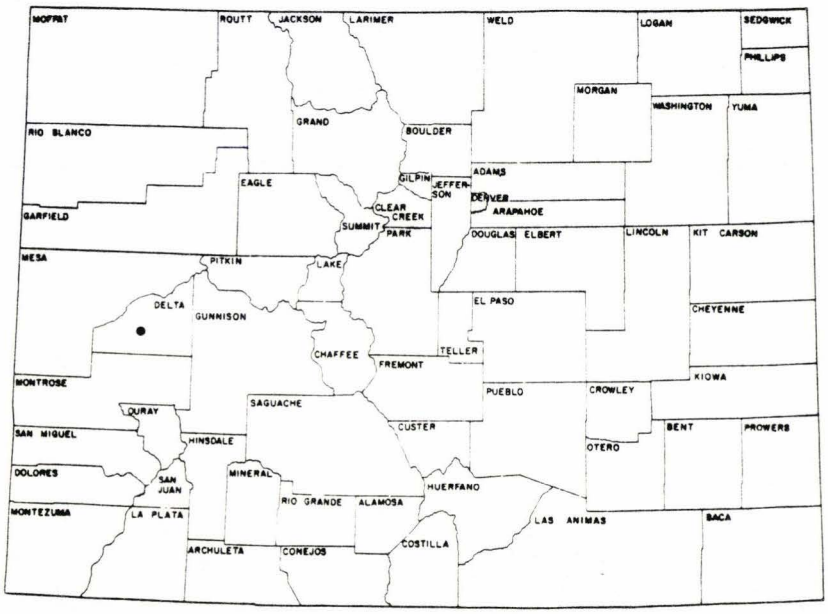
REMARKS: None

Eriogonum pelinophilum
U.S.D.A. Forest Service

ISOTYPE: PLANTS OF COLORADO
Eriogonum pelinophilum Reveal, sp. nov.
DELTA CO.: Along Colorado Highway 92, 8.6 miles west of the western edge of Hotchkiss, 0.9 mile east of the Red Mesa turnoff and 3.1 miles west of Lazear, 11.5 miles east of U.S. Highway 50 at Delta, on clay rolling hills associated with scattered specie of Atriplex and Eriogonum, at 6400 feet elevation.
ROCKY MOUNTAIN HERBARIUM

Herbarium Specimen in herbarium of Univ. of Wyoming, The Rocky Mountain Herbarium. Photo in R-2 Library.

No Illustration Available



POLYGONACEAE

SCIENTIFIC NAME: Eriogonum saurinum Reveal

ORIGINAL DESCRIPTION: Reveal, Great Basin Nat. 27(4):196. 1968.

COMMON NAME(S): Dinosaur buckwheat

KNOWN DISTRIBUTION: Dinosaur National Monument area (type locality vicinity of Vernal, Utah).

HABITAT: Steep hillsides and on the ridges of very acidic (pH often less than 5) soil of Mowrey shale; never more than 10 feet away from exposed shale; 5200 feet.

DESCRIPTION: Shrubby perennial, with a few open branches from woody caudices, 30-50 cm high. Basal area of stems densely hairy with whitish appearance, but green and not hairy above. Leaves lanceolate, basal, often deciduous up to 5-10 cm from the base. Leaf blades 3-6 cm long, 4-8 mm wide, densely hairy (whitish) on the lower surfaces and green on the upper surfaces. Inflorescences mostly three-branched with sessile, cream-white to pale yellowish-white flowers. Flowers hairy, if at all, only along the midribs. Achenes light brown, 215-3 mm long, with round bases which taper to 3-angled beaks. Flowers late July to September (Reveal 1968).

TAXONOMIC PROBLEMS: Has been incorrectly called E. lonchophyllum which is a species from northern New Mexico and southern Colorado.

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: NPS

REMARKS: None

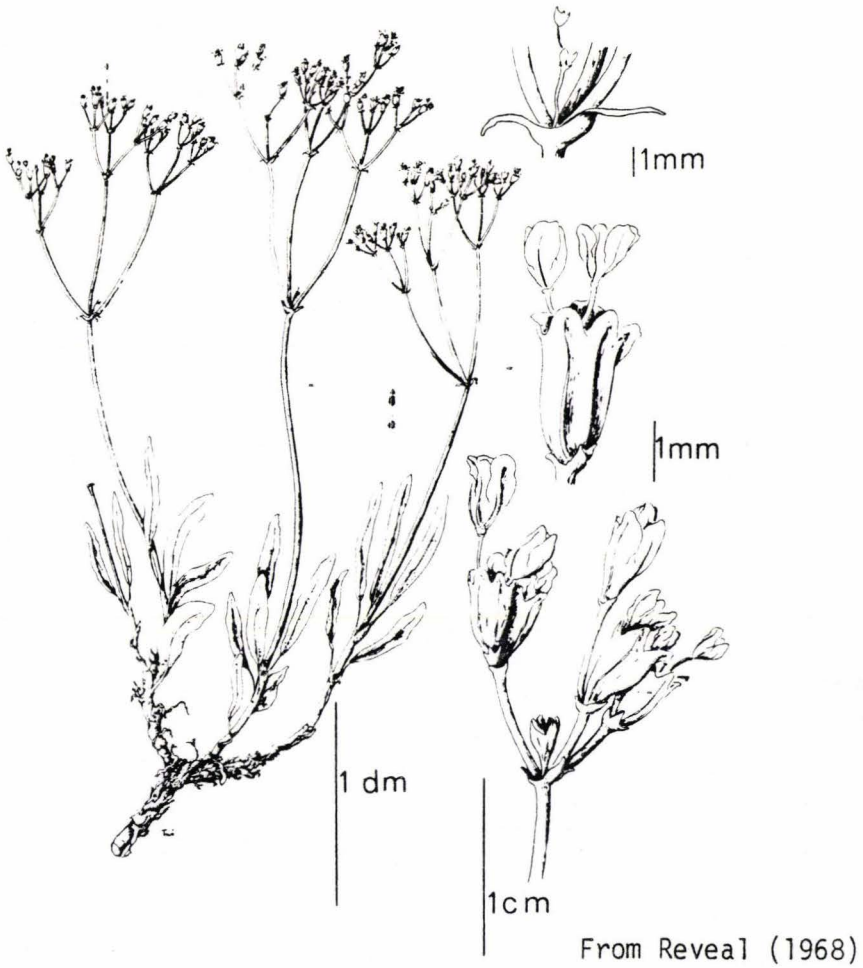
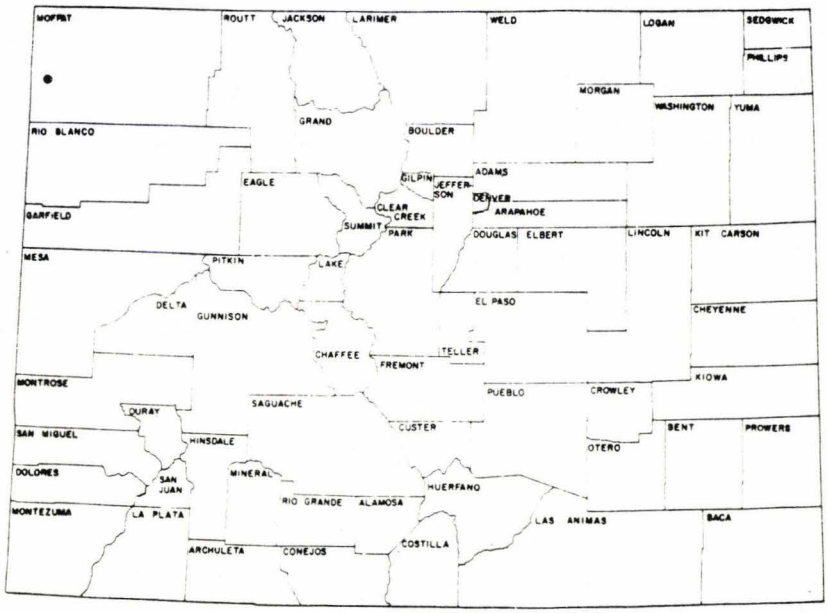


Fig. 4. Habit sketch of *Eriogonum saurinum* showing the general aspect of the species with enlarged drawings of the inflorescence, a single involucre with two exserted flowers, and the bracts subtending the inflorescence.



POLYGONACEAE

SCIENTIFIC NAME: Eriogonum viridulum Reveal

ORIGINAL DESCRIPTION: Reveal, Utah Acad. Proc. 42(2):287. 1965.

COMMON NAME(S): Wild buckwheat

KNOWN DISTRIBUTION: Moffat County (vicinity Green River); also in Uintah, Duchesne Counties, Utah. Representative locality: T 9N, R 101W.

HABITAT: Clayey banks along rivers and streams; associated with Atriplex and Artemisia; 5000 feet.

DESCRIPTION: Perennial; from a branched, woody caudex; stems slender; 10-30 cm tall; bright green; glabrous. Leaves linear, 1-2 mm wide, 1-4 cm long; white tomentose below, green above; rolled backward from edges toward lower side (revolute); with short petioles; mostly along the lower 4 cm of the plant. Inflorescence on stems 8-12 cm tall, with 3 branches at the first node and 2 or 3 branched above; branches erect; cymose. Flowers bright yellow with a brownish base at maturity; segments subequal; 1.5-2 mm long; involucre bracts glabrous on inside and outside. Achene brown; 1.5 mm long; with an oval base tapering to a short 3-angled beak. Flowers July, August, September (Reveal 1965).

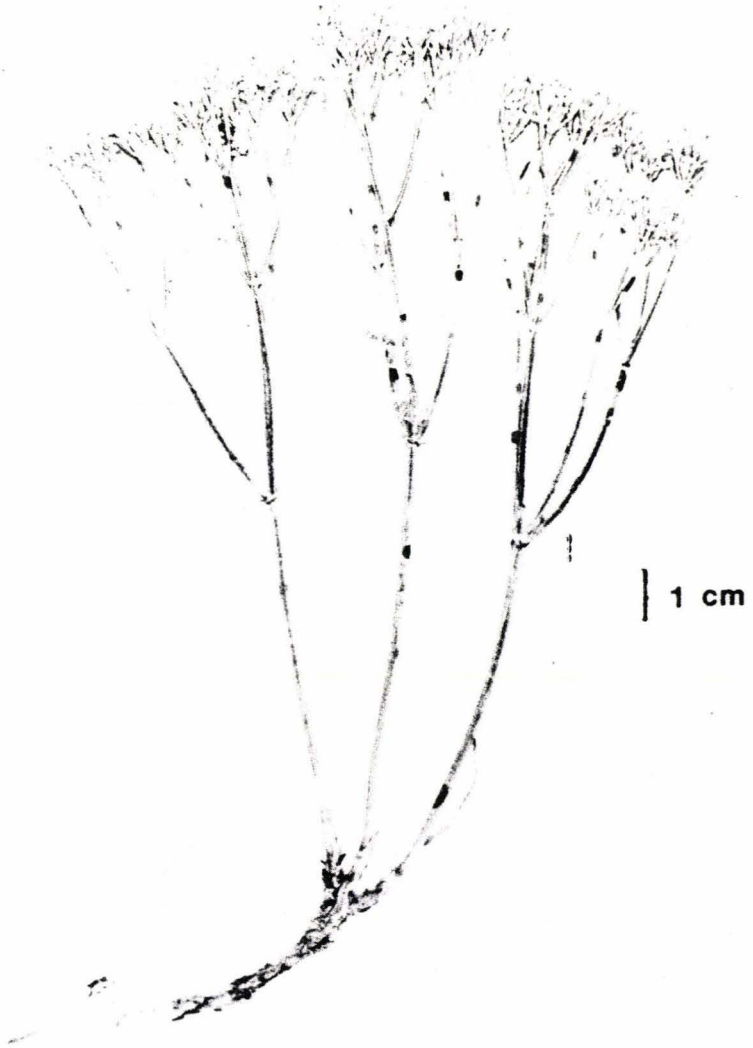
TAXONOMIC PROBLEMS: Formerly named E. brevicaule Nutt. var. brevicaule; closely related to E. contortum Small, and E. brevicaule var. leptothecum (S. Stokes) Reveal.

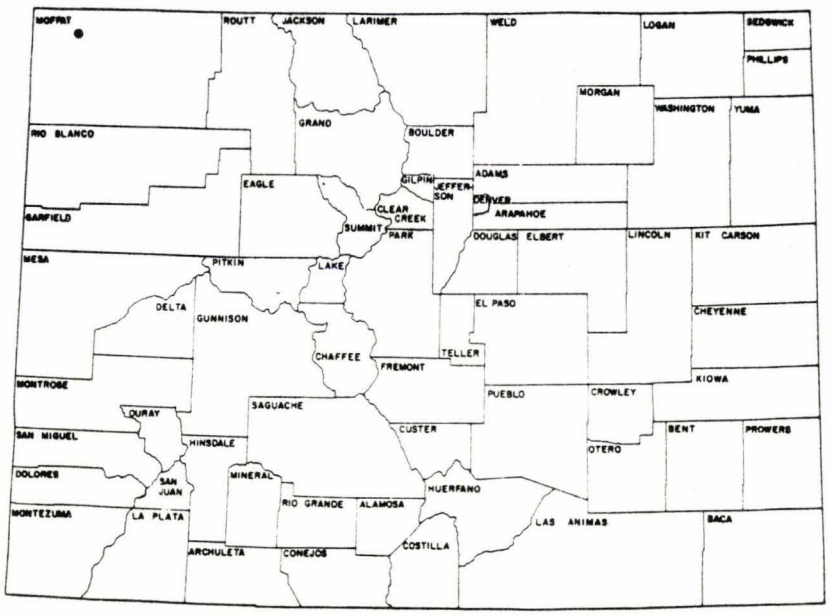
EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

REMARKS: None

Eriogonum viridulum





RANUNCULACEAE

SCIENTIFIC NAME: Aquilegia chrysantha var. rydbergii Munz

ORIGINAL DESCRIPTION: Munz, Gent. Herb. 7:138. 1946.

COMMON NAME(S): Columbine

KNOWN DISTRIBUTION: Southern Colorado, on moist shaded rocks; associated with A. chrysantha var. chrysantha.

HABITAT: Damp places, springs

DESCRIPTION: Stems 30-100cm. tall, glabrous or more or less pubescent above, often viscid; basal leaves mostly triternate; leaflets often pubescent below; flowers 5-9cm long and 4-7cm wide, clear golden yellow throughout, erect; sepals 2-3.5cm long; petals 8-20mm long; spurs 4-7cm long, very slender; follicles about 2.5cm long (Harrington 1954). A. chrysantha var. rydbergii differs from typical chrysantha by the smaller size of its flowers.

TAXONOMIC PROBLEMS: Possibly not a legitimate variety. The variety rydbergii occurs "occasionally throughout the range of the species" (Munz 1946).

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

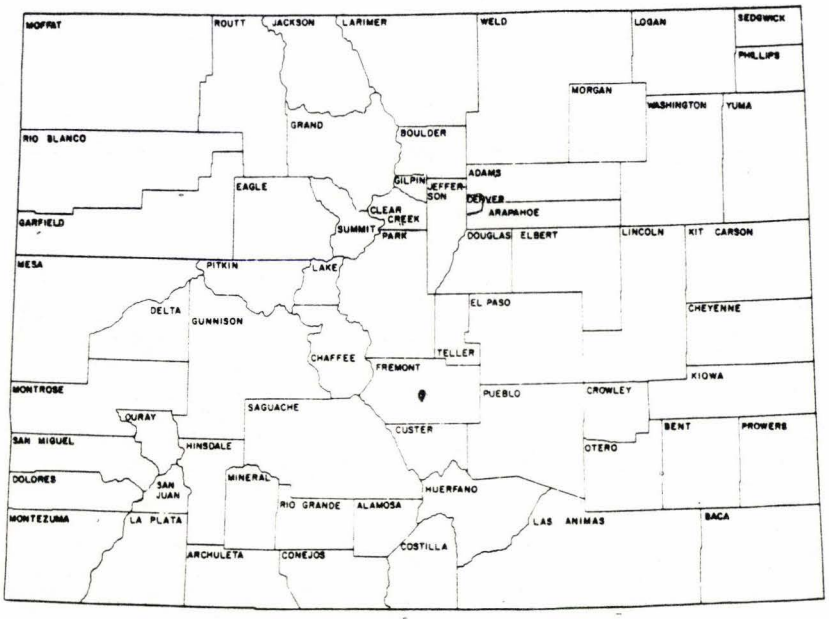
REMARKS: None

Additional Comments on Aquilegia chrysantha var. rydbergii:

This variety ranges from south-central, southern, and southwestern Colorado through New Mexico and Arizona and is probably the only variety of A. chrysantha in Colorado. It is widespread, common, and abundant in its range in Colorado and certainly does not deserve to be included on even the Proposed List.

Management agencies have not been indexed for this variety; neither have Counties.

No illustration Available



RANUNCULACEAE

SCIENTIFIC NAME: Aquilegia micrantha var. mancosana Eastwood

ORIGINAL DESCRIPTION: Eastwood, Proc. Cal. Acad. Sci., Ser. 2, Vol. IV, p. 261.

COMMON NAME(S): Spurless small-flowered columbine

KNOWN DISTRIBUTION: Southwestern Colorado; near the Mancos River, Montezuma County.

HABITAT: Along creeks and springs; shady spots.

DESCRIPTION: The variety mancosana is like the type species, A. micrantha, except the flowers lack spurs or have only small sac-shaped appendages. Stems are 30-60 cm tall, pubescent above, glabrous below, with biternate or triternate leaves. The under surfaces of leaves are pubescent, but sometimes only sparsely pubescent. The flowers are white, yellowish, pale blue or reddish and 3-4.5 cm long. Flowers: May, June, July (Harrington 1964).

TAXONOMIC PROBLEMS: Probably only a genetic deviant.

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: Unknown

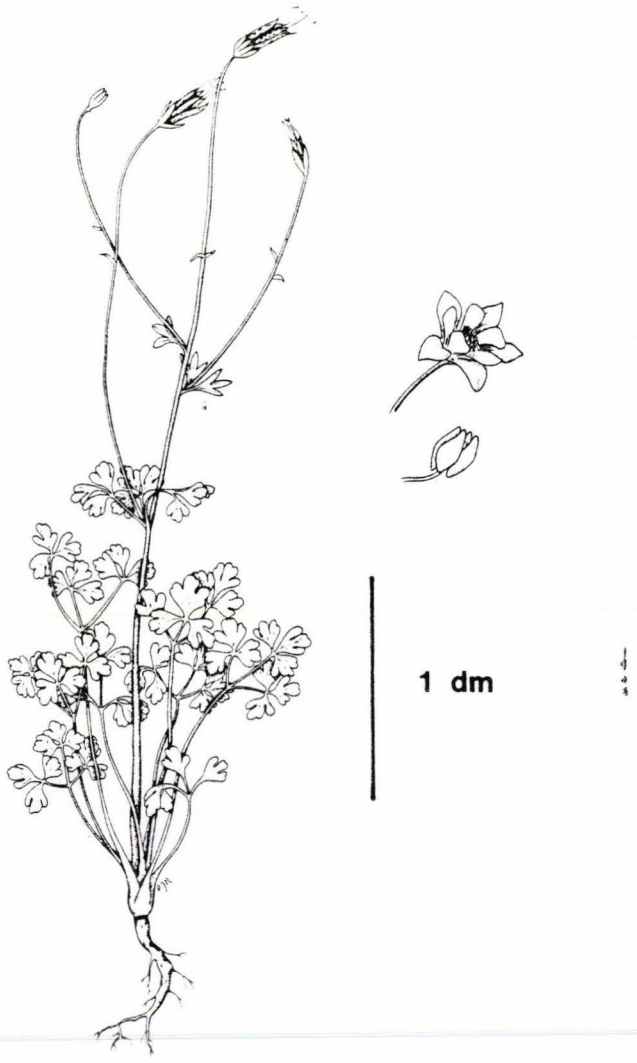
REMARKS: Could be threatened by commercial exploitation because of its spurless characteristic; not seen since August 1892.

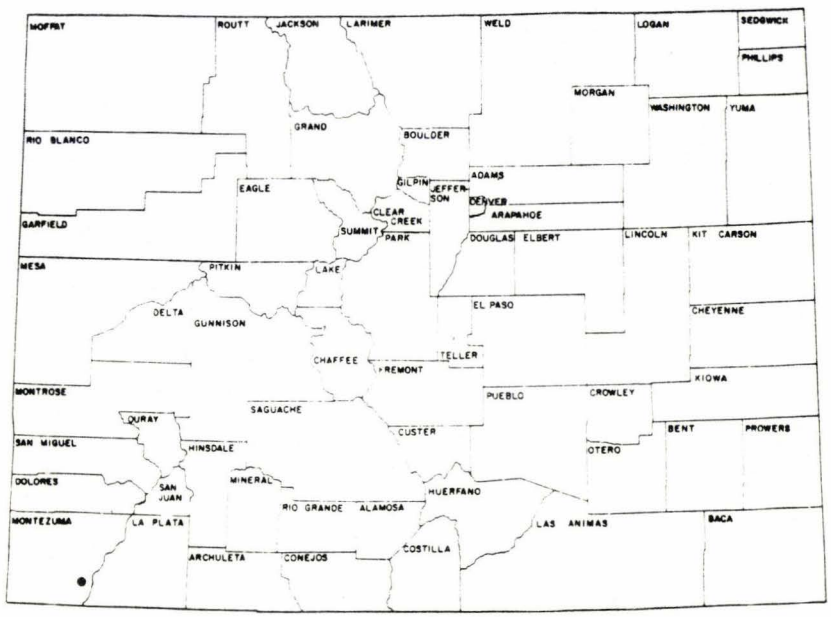
Additional Comments on Aquilegia micrantha var. mancosana:

This variety, described by Eastwood as a "degenerate form" of A. micrantha, is probably not a good taxonomic variety. However, it has not been seen since 1892 when it was seen in a side canyon off the Rio Mancos in southeastern Montezuma County, Colorado. This locality is deep within the Mountain Ute Indian Reservation; so far as is known, no one has searched for the plants in this century. The herbarium specimens may have been accidently destroyed, so Eastwood's description may be all the the information available.

The line drawing on page 102 was prepared by the process of drawing normal A. micrantha and leaving the spurs off. Thus, it is not known whether the plant actually looks like this, but it will serve as a guide. Aquilegia micrantha usually grows in shaded seeps under canyon overhangs or under waterfalls in the canyon country.

Aquilegia micrantha var. mancosana





SAXIFRAGACEAE

SCIENTIFIC NAME: Sullivantia purpusii (Brand.) Rosendahl

ORIGINAL DESCRIPTION: As Boykinia purpusii Brandegee, Bot. Gaz. 27:447. 1899; Rosendahl., Univ. Minn. Stud. Bio. Sci., No. 6:407. 1929.

COMMON NAME(S): None

KNOWN DISTRIBUTION: Gunnison (near Emerald Lake), Garfield (Glenwood Canyon), and Montrose Counties. Representative locality: T 45N, R 92W.

HABITAT: Wet rocks; limestone deposits at the foot of seeps from steep canyon cliffs. 7000-10,000 feet.

DESCRIPTION: Herbaceous perennial, 20-30 cm tall, with naked flowering stems and basal leaves. Leaves irregular; with 9-12 lobes and dentate edges; 2-3 cm long. Flowers white, arranged in panicled cymes; contain a 2-celled, half-inferior ovary and 5 stamens. Flowers in June (Harrington 1964).

TAXONOMIC PROBLEMS: None

EXISTING OR POTENTIAL THREATS: Unknown

LAND OWNERSHIP/MANAGEMENT: BLM, private, U.S. Forest Service

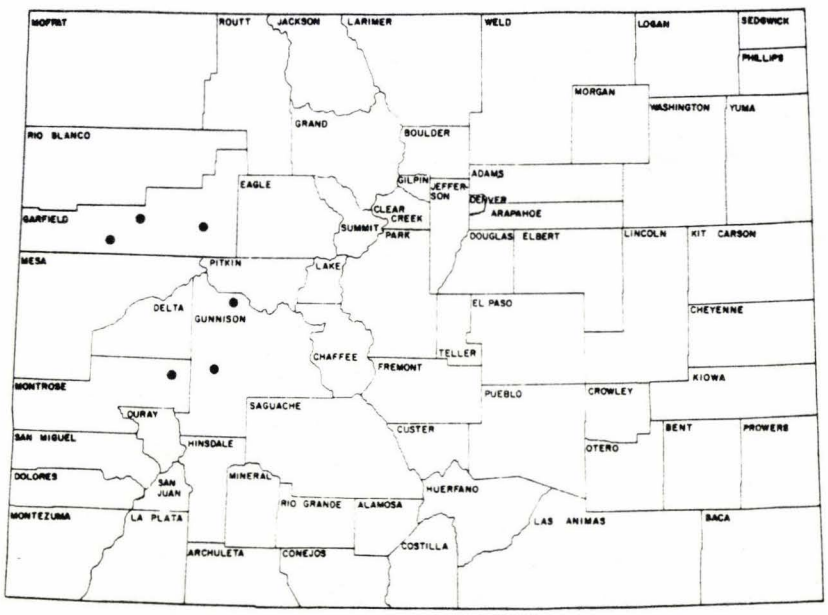
REMARKS: Occurs in widely scattered populations, but common where found. Well protected by its inaccessible habitat.

Additional Comments on Sullivantia purpusii:

This species is now known from about 12 populations. Some of these are medium sized to large and often contain over 1000 individuals. At none of these sites have any Endangering factors been observed, and the plants seem healthy.

Land Ownership/Management: Gunnison National Forest (Taylor River Ranger District); White River National Forest (Rifle, Eagle and Sopris Ranger Districts); Bureau of Land Management and private.

1 cm


MOFFAT
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JACKSON
LARIMER
WELD
LOGAN
SEDGWICK
PHILLIPS
MORGAN
WASHINGTON
YUMA
GRAND
BOULDER
RIO BLANCO
GILPIN
JEFFERSON
ADAMS
DENVER
ARAPAHOE
EAGLE
CLEAR CREEK
GARFIELD
SUMMIT
PARK
DOUGLAS
ELBERT
LINCOLN
KIT CARSON
MESA
PITKIN
LAKE
EL PASO
CHEYENNE
DELTA
GUNNISON
CHAFFEE
TELLER
FREMONT
KIOWA
MONTROSE
PUEBLO
CROWLEY
OURAY
SAGUACHE
CUSTER
BENT
PROWERS
SAN MIGUEL
HINSDALE
OTERO
DOLORES
SAN JUAN
MINERAL
HUERFANO
RIO GRANDE
ALAMOSA
MONTEZUMA
LA PLATA
LAS ANIMAS
BACA
ARCHULETA
CONEJOS
COSTILLA

SCROPHULARIACEAE

SCIENTIFIC NAME: Penstemon retrorsus Payson ex Pennell

ORIGINAL DESCRIPTION: Payson, Contr. U.S. Nat. Herb. 20:373. 1920.

COMMON NAME(S): Beardtongue

KNOWN DISTRIBUTION: Montrose County, vicinity Montrose. Representative locality: T 79N, R9W.

HABITAT: Found on Mancos shale in the saltbush vegetation type, with Gutierrezia, Juniperus, and Artemisia at higher elevations. Critical habitat is in gullies on north slopes, drainage areas at the base of north slopes, and where winter snowbanks persist. 5700-6000 feet.

DESCRIPTION: Perennial, with a mat-like appearance. Bases crowded with entire, oblanceolate or spatulate leaves, 2-3 mm wide, 8-15 mm long. Upper leaves variable either smaller or larger than basal leaves. Leaves, stems, and calyx ash colored due to dense hairs which point backward (toward the base of the leaves or stems) hence the name "retrorsus." Inflorescence distinct from the lower part of the plant. Flowers bluish-purple, 15-20 mm long, and contain glabrous anthers with a slender, bearded sterile stamen (staminode). Flowers from May until early June (Harrington 1964).

TAXONOMIC PROBLEMS: None

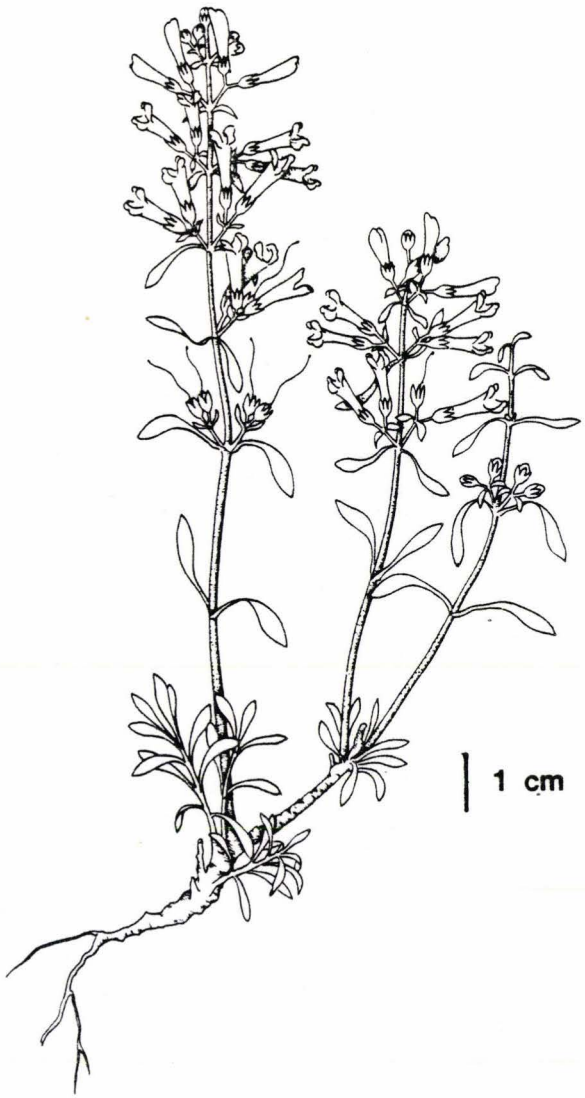
EXISTING OR POTENTIAL THREATS: Recreational use of Mancos shale hills by off road vehicles and vegetation modifications (interseeding and contour furrowing) to improve range for use by livestock threaten known populations.

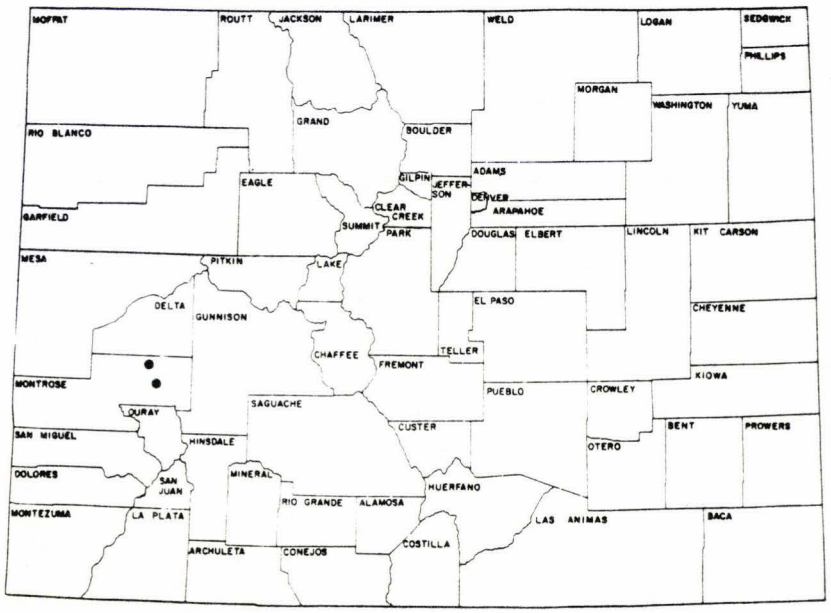
LAND OWNERSHIP/MANAGEMENT: BLM and private.

REMARKS: Sheep favor other species, such as Atriplex, and do not eat P. retrorsus. There is evidence that when sheep graze Mancos shale areas it reduces the competition by Atriplex and will increase the abundance of P. retrorsus.

Penstemon retrorsus
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library


1 cm


MOFFAT
ROUTT
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SEDGWICK
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MORGAN
WASHINGTON
YUMA
GRAND
BOULDER
RIO BLANCO
GILPIN
JEFFERSON
ADAMS
DENVER
ARAPAHOE
EAGLE
CLEAR CREEK
GARFIELD
SUMMIT
PARK
DOUGLAS
ELBERT
LINCOLN
KIT CARSON
MESA
PITKIN
LAKE
DELTA
GUNNISON
EL PASO
CHEYENNE
CHAFFEE
TELLER
FREMONT
KIOWA
MONTROSE
PUEBLO
CROWLEY
OURAY
SAGUACHE
CUSTER
BENT
PROWERS
SAN MIGUEL
HINSDALE
OTERO
DOLORES
SAN JUAN
MINERAL
HUERFANO
RIO GRANDE
ALAMOSA
MONTEZUMA
LA PLATA
LAS ANIMAS
BACA
ARCHULETA
CONEJOS
COSTILLA

2. SPECIES FROM WYOMING, SOUTH DAKOTA, NEBRASKA, AND KANSAS, AND ADDITIONAL COLORADO SPECIES

APIACEAE (UMBELLIFERAE)

SCIENTIFIC NAME:	Aletes humilis Coulter and Rose.
ORIGINAL DESCRIPTION:	Coulter & Rose, Contrib. U.S. Natl. Herb. 7:107 (1900)
COMMON NAMES:	Unnamed Aletes
KNOWN DISTRIBUTION:	Northcentral Larimer County, Colorado; it has also been reported from adjacent southern Albany County, Wyoming, where it is expected to be found.
HABITAT:	Forming mats on vertical granite cliffs and in cracks and crevices on summits of rocky granite tors; also found in cracks of granite rock under forest trees at bases of granite cliffs, 6900-7800 ft.
DESCRIPTION:	Plants mat-forming to 2.5 dm in diameter, with leaves that are bright green, shining, hairless, and pinnate with 5-7 leaflets; these leaflets are each palmately toothed with few teeth or lobes. Flowers and fruit few, on a very short scape that is hidden among the leaves, so that the flowers and fruit are almost invisible except when viewed closely; flowers tiny, yellow, blooming quickly and early; fruit ovate, about 3 mm long, hairless, shining, slightly flattened, with all its ribs more or less equal. Flowers in mid-May; fruit in early June.
TAXONOMIC PROBLEMS:	None known; this species is distinguished from all other species of Aletes by the sharply-toothed leaves, yellow flowers, and the scapes that are shorter than the leaves.
EXISTING OR POTENTIAL THREATS:	None observed. Several new sites have been discovered by the U.S. Forest Service recently; it is possible that several more remain to be discovered. These sites are all unlikely to be grazed (they are steep), but this species is probably resistant to moderate grazing nonetheless. The plants would probably not be affected by hikers and climbers on these rocks, but would be disrupted by any activity which might destroy or disturb the rocks of these cliffs and tors; apparently, no such activity is planned.
LAND OWNERSHIP/ MANAGEMENT:	Private; Roosevelt National Forest (Redfeather Ranger District).

REMARKS: This species is recommended on the Colorado Native Plant Society's "Working List of Proposed Threatened and Endangered Plant Special" (1978), It has not yet appeared on any Federal List. Presently known from 4-5 populations, total 1350 individuals.

ASCLEPIADACEAE

SCIENTIFIC NAME:	Asclepias meadii Torrey.
ORIGINAL DESCRIPTION:	Torrey ex A. Gray, Man. Bot. ed. 2, Add. 704 (1857). Also described in Woodson (1954), pp. 109-110.
COMMON NAMES:	None
KNOWN DISTRIBUTION:	Western Illinois, southwestern Wisconsin, southern Iowa, Missouri, and eastern Kansas.
HABITAT:	"Dry upland prairies and chert-lime glades, very scattered and rare." (Woodson 1954)
DESCRIPTION:	Perennial herbs, stems slender, unbranched, 20-40 cm tall, hairless and glaucous; leaves opposite, fairly broad, 5-7 cm long, 1-5 cm wide, entire, hairless and glaucous, obtuse at the base, on no petiole; flowers few, rather large, corolla greenish-cream tinged with purple outside and 7-9 mm long; stamens and hoods combined, on a stipe about 1.5 mm long and 2.5 mm broad; the hoods shaped like cowls, about 5 mm long, sessile on the stipe, more or less fleshy and inflated, pouched and with auricles; the horns beaked, somewhat shorter than the hoods; anther heads about 2 mm long and 3 mm broad; fruit erect on curved pedicels, narrow, 8-10 cm long and about 1 cm broad, hairless. Flowers from mid-June through July, fruit in July and August.
TAXONOMIC PROBLEMS:	The taxonomic position of this species is unknown.
EXISTING OR POTENTIAL THREATS:	Unknown
LAND OWNERSHIP:	Unknown. This species is known in Kansas from the far eastern counties (Douglas, Allen, and Miami Counties).
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975; proposed as Endangered in Federal Register, June 16, 1976.

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: *Antennaria arcuata* Cronquist

ORIGINAL DESCRIPTION: Cronquist, Leaflets West. Bot. 6:41-43 (1950). Description of female plants only.

COMMON NAMES: Unnamed Pussytoes.

KNOWN DISTRIBUTION: Three isolated localities: eastern Blaine County, Idaho; Elko County, Nevada; and southcentral Fremont County, Wyoming.

HABITAT: Immersed in grass-sedge tufts that are surrounded by standing water in spring, dry in late season. The plants have stolons that arch down off the tufts into the small gullies between the tufts. Male and female plants are in the proportion of about 1:1, and usually occupy different tufts in this meadow, 7300-7400 ft. (in Wyoming).

DESCRIPTION: Plants 8-15 cm tall, single stems from a simple root (not mat-forming), reproducing by means of curved, leafy stolons attached to the base of the stem and arching downward, these stolons up to 8 cm long. Stems, stolons, and leaves covered with a matted white tomentum, giving the plants a grayish-green appearance. Heads in a small, compact cluster at the end of the unbranched stem. Dioecious (that is, with separate male and female plants), the female heads narrow, 4-6 mm long, the involucral bracts well imbricated; male heads 4-6 mm long but about as wide as long, not as narrow as the female heads, the bracts not conspicuously imbricated. Flowers in late July or early August.

TAXONOMIC PROBLEMS: None known. This species is clearly unlike any other *Antennaria* in the western United States, distinguished by its lack of mat-forming ability and single, leafy stems.

EXISTING OR POTENTIAL THREATS: This species is apparently dependent on the tall grasses and sedges which make up the tufts in which it grows. The area of Wyoming in which this species grows is characterized by very heavy grazing use; this species was only found in tufts where the grasses and sedges were taller than 20 cm, apparently where there had been no grazing or very light grazing for the past 5-10 years. In other areas (in one case only 10 m away) where these tall grasses and sedges had been moderately to heavily browsed, this species was not found even after intensive searches.

	This species may well be Threatened by grazing, but more population surveys and searches for other populations must be made before any definite conclusion may be reached.
LAND OWNERSHIP/ MANAGEMENT:	In Wyoming, private and Bureau of Land Management. Unknown in Idaho or Nevada.
REMARKS:	Proposed Endangered in Federal Register, June 16, 1976. The only known Wyoming population comprises about 50 plants, but more populations may well be discovered.

Antennaria arcuata
U.S.D.A. Forest Service

Photo from U.S.D.A. Forest Service, Region 2 Library

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME:	*Artemisia argilosa* Beetle
ORIGINAL DESCRIPTION:	Beetle, Rhodora 61:84-85 (1959). Also described by Beetle in Wyoming Agric. Expt. Sta. Bull. 268:79-80 (1960).
COMMON NAMES:	Coaltown Sagebrush (Beetle 1960).
KNOWN DISTRIBUTION:	Southwestern North Park in Jackson County, Colorado.
HABITAT:	"On strongly alkaline soil associated with greasewood and saltsages (*Atriplex* sp.)." (Beetle 1959) Around 8300 ft.
DESCRIPTION:	"Erect shrub 5-8 dm tall, the branches erect; leaves up to 4 cm long, deeply trifid, each lobe and the base below the divisions 2-3 mm broad; new growth grayish white; heads broadly campanulate, 5-10 flowers in a head, corolla 3.0-3.5 mm long, the achene 1.8 mm long. New growth in April, young heads in late July, flowering in late August, and seed ripe in October." (Beetle 1960)
TAXONOMIC PROBLEMS:	Beetle (1959 and 1960) admits that this species is intermediate in character between *Artemisia cana* ssp. *viscidula* and *A. longiloba*, both of which occur in North Park in the vicinity of *A. argilosa*. He therefore supposes that this species is of hybrid origin between the former two species but states that it "does not occur mixed with its theoretical parents, and integration . . . does not occur in this area." In addition, there is no Taxonomic system for this genus which has satisfied most of the workers who have studied it. The several systems in use are contradictory. Careful field and garden study seems indicated.
LAND OWNERSHIP/ MANAGEMENT:	Private. Also possibly Bureau of Land Management.
EXISTING OR POTENTIAL THREATS:	As far as is known, no one has surveyed the only known population for possible Threats.

REMARKS: Recommended as Endangered by Smithsonian (1978), this species also appears on Colorado Native Plant Society's "Working List" (1978). As far as is known, this species has not been the subject of careful population surveys.

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME	*Erigeron allocotus* Blake.
ORIGINAL DESCRIPTION:	Blake, J. Washington Acad. Sci. 27:379-380 (1937). Also described by Cronquist, Brittonia 6:245 (1947).
COMMON NAMES:	Unnamed Fleabane.
KNOWN DISTRIBUTION:	Western slope of the Bighorn Mountains in eastern Bighorn County and eastern Washakie County, Wyoming, and in adjacent southern Carbon County, Montana.
HABITAT:	On dry, rocky, limestone outcrops and slopes, usually in open areas but sometimes partially shaded by Curl-leaf Mountain Mahogany shrubs, 4400-7500 ft.
DESCRIPTION:	Perennial plants, low, branched from the base, with erect to ascending branches 10-15 cm long; leaves 3-5 on each stem and also basal but not forming a basal rosette, each leaf entire or more often 3-lobed, the lobes entire and about half the length of the whole leaf; stems, leaves, and involucral bracts covered with coarse hairs spreading at right angles to the surfaces, and also usually covered with tiny glandular hairs; heads 4-6 mm high, ray-flowers white or off-white (drying pink), disk yellow; pappus of bristles, not double (that is, not with a shorter outer series of scales in addition to the long bristles). Flowers from early June through July, fruit in late July.
TAXONOMIC PROBLEMS:	This species is closely related to *E. compositus*, a widespread species which also grows in this area on similar habitats. *E. allocotus* is usually distinguished by the stem leaves that are about the same size as the basal leaves (not conspicuously reduced), the once-ternate leaves (*E. compositus* usually has leaves that are divided more than once), and the coarse-spreading hairs. None of these characters are consistent in the Bighorn Mountains. However, careful comparison of the populations of the two species in this area is needed.

EXISTING OR POTENTIAL THREATS:	None have been seen even though several populations have been surveyed. These plants are apparently resistant to moderate grazing and also tolerate trampling by human foot travel.
LAND OWNERSHIP/ MANAGEMENT:	Bighorn National Forest (Paint Rock and Tensleep Ranger Districts); Bureau of Land Management; probably also private.
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975. So far, eight populations are known with about 1000-1500 total individuals. However, several populations have been recently discovered and more probably will be discovered.

Erigeron allocotus
U.S.D.A. Forest Service

Photo from U.S.D.A. Forest Service Region 2 Library

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: Hymenoxys helenioides (Rydberg) Cockerell

ORIGINAL DESCRIPTION: Rydberg, in Bull. Torr. Bot. Club 28:21 (1901). Also described by Cockerell, in Bull. Torr. Bot. Club 31:481 (1904).

COMMON NAMES: Unnamed Hymenoxys

KNOWN DISTRIBUTION: Four widely separated localities: upper Sangre de Cristo Creek, northeastern Costilla County, Colorado; Cebolla Creek, northeastern Hinsdale County, Colorado; western Carbon County, Utah; and northeastern Apache County, Arizona.

HABITAT: Exact habitat is unknown. This species has not been seen in Colorado since 1940. However, both Colorado localities are associated with an open creek bottom within the subalpine zone. Rydberg, one of two people to have seen it in Colorado, says habitat is "river valley." (Rydberg 1915.) Cockerell says, "The plant is evidently a mesophyte," but he did not see the plant in its native habitat, and it is unknown from whence this information came. He and Rydberg were contemporaries, and it is possible that Cockerell's statement reflects personel communication, although Cockerell's altitude calculations are mistaken. The original (type) specimen was collected at "about 2700m" (Rydberg 1901; = 8860 ft.), and the Penland collection from Hinsdale County must be from over 9000 ft., so the species in Colorado probably ranges 8500-9500 ft. The altitudes in Cockerell (1904) and those given by Parker in Harrington (1954) are based on miscalculations.

DESCRIPTION: Related to H. richardsonii (commonly called Pingue), but a much larger plant; stems erect, unbranched at base and sparingly branched in the upper two-thirds, up to 50 cm tall or more, with leaves that are 2-11 mm wide, entire or divided into 3-5 narrow lobes, the middle stem-leaves about 10 cm long; heads few to many, much larger than in H. richardsonii, up to 15 mm broad, dark yellow or orange in color. This

	species looks somewhat like Dugaldia (Orange Sneezeweed), but has thinner, narrower leaves, and the involucral bracts are not reflexed (turned back downward along the stems). Flowering specimens collected in early July.
TAXONOMIC PROBLEMS:	Parker, in Harrington (1954), claims that this species "apparently intergrades with H. richardsonii." It is not known what is the basis for this statement, but specimens of the two species are very different. This species needs to be rediscovered before this question may be resolved.
EXISTING OR POTENTIAL THREATS:	Unknown; the reasons for the disappearance of this species from Colorado are unknown.
LAND OWNERSHIP/ MANAGEMENT:	Private; possibly Gunnison National Forest (Cebolla District).
REMARKS:	The widely-dispersed distribution of this species is strange and results from unknown factors. The two known Colorado localities for this species have been intensively searched for two field seasons without any trace of this species.

Hymenoxys helenioides
U.S.D.A. Forest Service

Herbarium specimen in herbarium of Colorado College,
Photo from U.S.D.A. Forest Service Region 2 Library

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: Saussurea weberi Hulten.

ORIGINAL DESCRIPTION: Hulten, Svensk Bot. Tidskr. 53:200-202 (1959).

COMMON NAMES: None.

KNOWN DISTRIBUTION: Alpine tundra in the high mountains of central Colorado, known from northeast and northwest Park County, Colorado; disjunct at one locality in the Anaconda Range of Deer Lodge County, Montana.

HABITAT: Scattered through tall-grass alpine tundra, usually on a fairly dry site, often on tundra "islands" surrounded by small stabilized-talus bowls; sometimes in steep gullies, coming up through the lower branches of low willows; 11,900-12,800 ft. (Colorado); 10,000-10,100 ft. (Montana).

DESCRIPTION: Perennial plants, each usually with a single unbranched stem, the stem stiff, unbendable (the lignified portion extending below ground level so that the stem returns upright when trampled); stem leaves several, green, petioled, sparsely covered above and below with loose tomentum, with an obvious white midrib below and pointed tip; heads in a dense, capitate cluster at the end of the stem; no ray-flowers but the disk-flowers exserted from the pappus and royal-purple in color; thus, the cluster of heads appears like a rounded cottony tuft of white hairs (the pappus) from which protrudes the narrow, royal-purple disk-flowers. Flowers from mid-July to early August; fruit from early August to mid-August; the dry, stiff stems persisting several seasons after flowering.

TAXONOMIC PROBLEMS: This species is different from most other Saussureas and is the only species of this genus in the southern Rocky Mountains.

EXISTING OR POTENTIAL THREATS: This species is currently known from seven populations (including the one in Montana), but all of these populations are very small, usually less than 20 and often less than 10 individuals per population. The total number of plants in existence is estimated at less than 90; in addition, the plants usually occur scattered

through the tundra. There is some evidence that one of the populations is very slowly moving across one hillside (perhaps 1-2 m/yr.), but this has not been confirmed. This is a sensitive species with poorly understood ecology.

LAND OWNERSHIP/ MANAGEMENT: Pike National Forest (South Park and South Platte Ranger Districts); Bureau of Land Management (Canon City District); has been found within 20 yds. of White River National Forest (Dillon District).

REMARKS: Recommended as Endangered by Smithsonian (1978), and also appears on Colorado Native Plant Society's "Working List" (1978).

Saussurea weberi
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service Region 2 Library

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME:	Sphaeromeria simplex (A. Nelson) Heller, previously known as Tanacetum simplex A. Nelson.
ORIGINAL DESCRIPTION:	A. Nelson, Bull. Torrey Bot. Club 26:484 (1899).
COMMON NAMES:	Laramie False-Sagebrush (USFWS letter, 1978; after R. D. Dorn, official report to USFWS).
KNOWN DISTRIBUTION:	Along base of foothills just southwest of the city of Laramie, Albany County, Wyoming.
HABITAT:	Almost flat benches, in benches with open aspect, or in clearings within Mountain Mahogany stand, in pockets of relatively well-developed soil (not in limestone pavement microhabitats) derived from white limestone with small (1 in. or less diameter) limestone gravel on the soil surface; low benches just above the Laramie plain, at the foot of the foothills, 7350 ft; always found growing with Phlox bryoides.
DESCRIPTION:	Herbaceous perennial, tufted but not matted; leaves mostly basal; in addition, two or three on each stem, stems 5-15 cm tall, unbranched, stem and leaves covered with a fine gray matted pubescence that gives a color like sagebrush to the plant; leaves all narrow, 2-3 cm long, mostly entire but occasionally bifid or trifid at the tips; head solitary on the stem, 6-8 mm high; involucral bracts with a yellowish-green color, probably the key character for spotting the plant in the field; ray-flowers none, disk yellow; pappus none. Flowers from late May through mid-June; fruit from mid- to late June.
TAXONOMIC PROBLEMS:	This species is considered very distinct, not closely related to any other; see Holmgren, Shultz and Lowrey, in Brittonia 28:252-262 (1976).
EXISTING OR POTENTIAL THREATS:	This species was lost from 1907 through 1977 in spite of concentrated efforts by many qualified persons to rediscover it. As now known, it consists of 5-6 populations, totalling 340-450 individuals, occupying a fairly small area of ground. These populations all grow on a stratum

that is currently the site of an active limestone quarry; the quarrying operations have presumably already destroyed part of at least one population. It is unlikely that more populations of this species remain to be discovered in light of the intensity with which most of the country around this site has been searched. This species is definitely Endangered and deserves official status as such as soon as possible.

LAND OWNERSHIP/ MANAGEMENT: Private

REMARKS: Proposed as Threatened in Federal Register, July 1, 1975.

Sphaeromeria simplex
U.S.D.A. Forest Service

Photo from U.S.D.A. Forest Service R-2 Library

ASTERACEAE (COMPOSITAE)

SCIENTIFIC NAME: Townsendia spathulata Nuttall.

ORIGINAL DESCRIPTION: Nuttall, Trans. Amer. Phil. Soc. II 7:305 (1840). Also described by Beaman, Contrib. Gray Herb. 183:121-3 & 94-5 (1957).

COMMON NAMES: None.

KNOWN DISTRIBUTION: Natrona, Sweetwater and Fremont Counties, Wyoming.

HABITAT: White-limestone benches and mesas at lower elevations in a "mat-plant" community (that is, with all the plant species forming low, rounded mats spaced 1-5 dm apart on the barren white flats), at higher elevations between limestone pavement-rocks on grassy mesa tops with windswept limber pines, 5200-9000 ft.

DESCRIPTION: Low, caespitose, forming a small rounded "mat," up to 4 cm high; leaves spatulate, all basal with at least a few long-tangled woolly hairs and sometimes (at lower elevations) densely covered with them; heads on very short stems and appearing matted in the leaves, the stems not usually visible, heads 8-16 mm wide, up to 10 mm high, with ray-flowers that are white to pink on the upper surface, deep flat-pink on the lower surface; disk-flowers yellow. Flowers in early May to mid-June, depending upon elevation; fruit shortly afterward.

TAXONOMIC PROBLEMS: The lowland populations of T. spathulata from Natrona, southern Fremont and northern Sweetwater Counties, were considered by Beaman (1957) to be a distinct species on the basis of the pulvinate habit and presence of long-tangled woolly hairs on the leaves. However, the populations in central Fremont County at higher elevations have less of the long hairs and slightly different flower color (not considered a "good" character in this genus), and are tending to be intermediate between this species and T. leptotes, but more similar to T. spathulata; these populations are nearly all apomicts and could have been formed by hybridization.

EXISTING OR POTENTIAL THREATS:	In the Sweetwater County and Fremont County populations, no Threats have been seen. It is very likely that more populations of this species will be discovered in the future, especially on the outcrops of Madison Limestone along the eastern edge of the Wind River Range. As far as is known, no Threats have been documented for the Natrona County populations.
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management; Shoshone National Forest (Lander Ranger District); private.
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975.

Townsendia spathulata
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME:	Arabis demissa Greene var. languida Rollins.
ORIGINAL DESCRIPTION:	Rollins, Rhodora 43:388 (1941).
COMMON NAMES:	Unnamed Rock-Cress.
KNOWN DISTRIBUTION:	Two widely separated localities: the Laramie Hills of eastern Albany County, Wyoming, and near Flaming Gorge in south central Sweetwater County, Wyoming, and adjacent northern Daggett County, Utah.
HABITAT:	Unknown for the Albany County population(s), but presumably the same as for the other two varieties of this species: exposed rocky benches and knolls, always in soil derived from alkaline rock and often from limestone, usually growing between close-spaced flat surface pavement-stones; this variety 7300-7400 ft (probably) in Albany County; elevation unknown for the Sweetwater County and Utah populations.
DESCRIPTION:	Perennial herb, stems 1-3 dm tall from a simple or branched root; stems usually simple and unbranched; basal leaves narrow, entire, with large simple coarse trichomes on the margins, the outer basal leaves broader than the inner ones; stem leaves several, remote (that is, not overlapping one another), clasping the stem and with auricles; flowers cruciferous, white or pink; mature fruit narrow, with a single row of seeds, arched downward but not close to the stem nor at right angles to it, on a short stem 4-7 mm long. Flowers in mid- to late May; fruit in late May or June.
TAXONOMIC PROBLEMS:	The distribution of this variety is strange and not easily explained. When this variety and var. russeola were proposed, the distribution of var. demissa was poorly known, and thought to be restricted to an area far to the south. In recent years, the gap in geographical ranges among all three varieties of this species has gotten smaller and smaller. This species complex needs more study, especially in the area of apparent overlap among all three varieties in northwestern Colorado.
EXISTING OR POTENTIAL THREATS:	As far as known, no Threats have been recorded for the Sweetwater County and Utah populations,

but the Albany County population(s), have not been rediscovered in recent years despite extensive searches. Any tanonomic studies or conclusions about Threat must await this rediscovery.

LAND OWNERSHIP/ MANAGEMENT: Bureau of Land Management; in Albany County possibly private, Bureau of Land Management, or State of Wyoming (exact ownership unknown because exact locality unknown).

REMARKS: Proposed as Threatened in Federal Register, July 1, 1975.

Arabis demissa var. languida
U.S.D.A. Forest Service

Herbarium Specimen in herbarium of Univ. of Wyoming, the Rocky Mountain Herbarium. Photo in R-2 Library

BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME:	Arabis demissa Greene var. russeola Rollins.
ORIGINAL DESCRIPTION:	Rollins, Rhodora 43:387 (1941).
COMMON NAMES:	Unnamed Rock-Cress.
KNOWN DISTRIBUTION:	In two widely separated areas, the Laramie Hills of eastern Albany County, Wyoming, and the upper Green River Basin of Southern Fremont County and Sweetwater County, Wyoming, and extending south to the region of Dinosaur National Monument, Moffat County, Colorado, and near Flaming Gorge in Daggett County, Utah.
HABITAT:	Unknown for the Albany County population(s); presumably exposed rocky benches and knolls, always in soil derived from alkaline rock and often from limestone, usually growing between close-spaced flat surface pavement stones. Altitude 5500-7500 (western Wyoming, Utah, and Colorado); altitude unknown for the Albany County population(s).
DESCRIPTION:	Perennial herb, stems 1-2.5 dm tall from a simple or branched root; stems usually simple and unbranched; basal leaves narrow, entire, with large simple coarse trichomes on the margins, the outer basal leaves narrow; stem leaves several, remote (that is, not overlapping one another), without auricles; flowers cruciferous, white; mature fruit narrow, with a single row of seeds, arched downward but not close to the stem nor at right angles to it, on a short stem 4-7 mm long; like var. demissa only none of the hairs on the faces of the basal leaves forked or stellate, all of them simple, and the basal portion of the stem glabrous or nearly so. Flowers in mid-May to mid-June; fruit from early June to early July.
TAXONOMIC PROBLEMS:	See discussion under var. languida.
EXISTING OR POTENTIAL THREATS:	As far as known, no Threats have been recorded for the western Wyoming, Utah, or Colorado populations, but the Albany County population(s) have not been rediscovered in recent years despite extensive searches.
LAND OWNERSHIP/ MANAGEMENT:	Unknown since exact locality unknown.
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975.

BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME:	Draba nivalis Liljeblad var. brevicula Rollins.
ORIGINAL DESCRIPTION:	Rollins, Rhodora 55:233-234 (1953).
COMMON NAMES:	Unnamed Draba
KNOWN DISTRIBUTION:	West side of Clay Butte, northern Park County, Wyoming.
HABITAT:	In very small vertical cracks in west-facing, damp limestone cliffs, with very little soil development; usually jammed into the crack, with never more than one plant seen in each crack; also found rooted in mosses in steep limestone crevices just below these same cliffs, 9900-10,000 ft.
DESCRIPTION:	Tiny perennial herb with basal leaves broad, rounded at tips, leaves with surfaces covered with very small forked hairs but still green in color; stems usually 1-3 per plant, sometimes more, with no stem leaves, up to 6 cm long but often shorter, tending to lie flat along the vertical cliff in which the plant grows; flowers few, cruciferous, white to light yellowish-white; fruit oval, large relative to the plant, purplish, shining, hairless, 4-8 mm long, 1.5-2.5 mm wide, with very short style or none. Flower in late July, fruit in early August.
TAXONOMIC PROBLEMS:	This variety is very different from most other forms of D. nivalis in its hairless stem and pedicels, broader siliques, and broader basal leaves that appear green. There were no other forms of D. nivalis seen on Clay Butte. Var. brevicula presents no taxonomic problems and should remain distinct.
EXISTING OR POTENTIAL THREATS:	No Threatening factors were seen at the only site known which consists of 3 populations totalling 163 individuals. However, since all these populations are very close to each other and this variety is not known from any other place, it would be very easy to eradicate it; this site needs to be very carefully and periodically checked.
LAND OWNERSHIP/ MANAGEMENT:	Shoshone National Forest (Clarks Fork Ranger District).
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975.

Draba nivalis var. brevicula
U.S.D.A. Forest Service

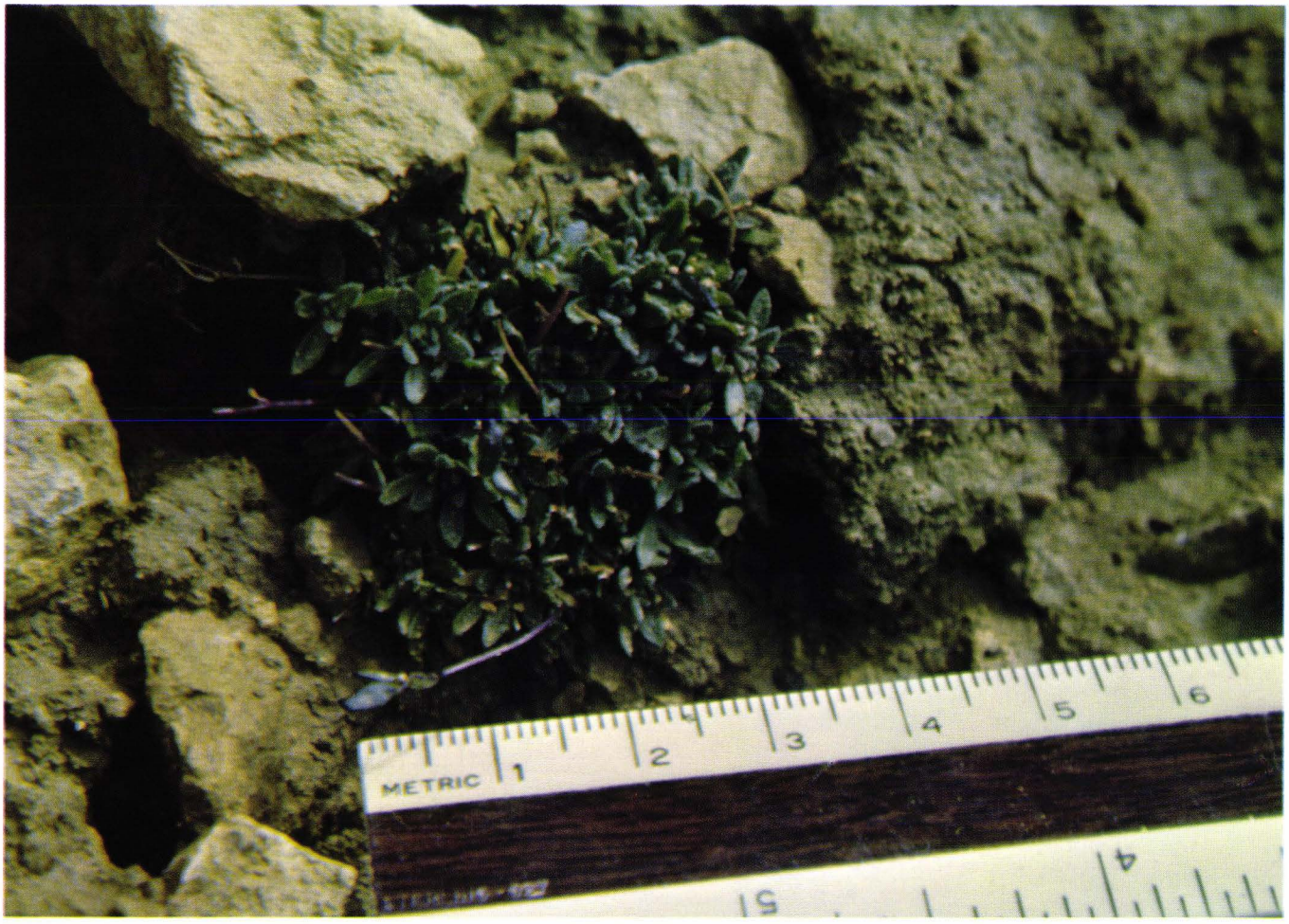

Photo in U.S.D.A. Forest Service R-2 Library

SCIENTIFIC NAME: Draba oligosperma Hooker var. pectinipila (Rollins) C. L. Hitchcock.

ORIGINAL DESCRIPTION: Rollins, Rhodora 55:239-241 (1953). Also described by Hitchcock, Vasc. Plants Pacific Northwest 2:496 (1964).

COMMON NAMES: Unnamed Draba.

KNOWN DISTRIBUTION: Known from three widely-separated areas; northern Gunnison County, Colorado; northwestern Park County, Wyoming, and adjacent southern Montana; and the mountains of northern British Columbia extending northward to the Alaska-Yukon border. The populations cited by Rollins (1953) from Daggett County, Utah, have recently been described as Draba juniperina Dorn, which is now known from southern Sweetwater County, Wyoming, and Moffat County, Colorado, as well as northeastern Utah. Draba juniperina is probably a distinct entity, which is not included in the discussion here.

HABITAT: In Colorado and Wyoming, known from steep alpine slopes on small shelves or benches in the topmost "breaks" in the slope between the tundra community above and the steep loose rockslide below, and therefore between the matted tundra-form and the branched rockslide-form of D. oligosperma var. oligosperma. 12000-12500 ft (Colorado), 9900-10100 ft, northern Wyoming). Always found on alkaline soil, usually derived from limestone.

DESCRIPTION: Perennial herb, stems in clumps or singly, loosely matted, basal leaves narrow; stems 3-15 cm tall, with no stem leaves; basal leaves, stems, pedicels, and often fruit, covered with unique hairs that are "doubly pectinate" (with a central axis and forked branches on each side); flowers several to many on each stem, cruciferous, reported as white in Rollins (1953) but actually light yellowish-white to light yellow; fruit on pedicels 5-10 mm long, the fruit oblong, 5-8 mm long, 2-3 mm wide, purplish-tinged, with a short style up to 0.8 mm long. Flowers in late June-early July (Colorado) or late July (northern Wyoming), fruit in mid-July (Colorado) or early August (northern Wyoming).

TAXONOMIC PROBLEMS: This entity has been considered a species by some, but it always (as far as known) occurs associated with normal D. oligosperma; however pectinipila does form continuous, homogenous populations on a microhabitat scale. In addition, there are a number of herbarium specimens from Canada that appear intermediate in characters of pubescence, silique shape, and habitat. Indeed, at the type locality for pectinipila (Clay Butte, northern Park County, Wyoming), there is some variation in pubescence (particularly of the siliques) and silique shape, although pectinipila is always clearly differentiated. It is believed that pectinipila is best treated as a variety of D. oligosperma.

EXISTING OR POTENTIAL THREATS: None have been observed at any site. However, the Colorado populations seem to be very small (less than 15 individuals/population). The Park County, Wyoming, site has about 5 populations, totaling 135 individuals, but it is likely that more sites will be discovered for this variety, especially in Colorado and southern Montana.

LAND OWNERSHIP/ MANAGEMENT: Gunnison National Forest (Taylor River Ranger District), Shoshone National Forest (Clarks Fork District).

REMARKS: Suggested as Threatened by Smithsonian (1978).

Draba oligosperma var. pectinipila
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME:	Lesquerella fremontii Rollins & Shaw.
ORIGINAL DESCRIPTION:	Rollins & Shaw, The Genus Lesquerella 228 (1973).
COMMON NAMES:	Unnamed Bladder-Pod.
KNOWN DISTRIBUTION:	Southern Fremont County, Wyoming.
HABITAT:	Exposed limestone ridgetops and clay slopes derived from limestone, almost always in the Madison formation, in fairly well-developed soils, in open sun, 7600-9000 ft.
DESCRIPTION:	Perennial herbs with 1-4 unbranched stems from the base, the stems thin, prostrate to ascending; basal leaves fairly narrow, with petioles, several leaves on the stem; each stem with several to many yellow flowers and later with egg-shaped or spherical fruit on a 1 cm pedicel; fruit, stems, and basal leaves covered with granular stellate trichomes; in fruit, the pedicel is turned back along the stem so that the fruit finally becomes pendulous and 4-8 mm in diameter, with a short style 1.5-2 mm long. Flowers in mid- to late June, fruit in early July.
TAXONOMIC PROBLEMS:	This species is very closely related to L. macrocarpa, of central Sweetwater County, Wyoming, but is always distinct and distinguishable from it. The two species never grow in the same area.
EXISTING OR POTENTIAL THREATS:	This species was not seen from 1947 to 1977, but this must be because no one looked for it! At least eight populations are now known, and it is very possible that several to many more will be discovered in the future. All populations seen so far are medium to large sized, and seem to be very healthy. No Threats have been noticed; because of the prostrate habit, this species is apparently resistant to grazing, even when it is heavy.
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management (Lander District), Shoshone National Forest (Lander District), and private.

REMARKS: Proposed as Endangered in Federal Register, July 1, 1975, and again on June 16, 1976.

Lesquerella fremontii
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

BRASSICACEAE (CRUCIFERAE)

SCIENTIFIC NAME:	*Lesquerella macrocarpa* A. Nelson.
ORIGINAL DESCRIPTION:	A. Nelson, Bot. Gaz. 34:366 (1902). Also described in Rollins & Shaw, The Genus Lesquerella 229-231 (1973).
COMMON NAMES:	Unnamed Bladder-Pod.
KNOWN DISTRIBUTION:	Central Sweetwater County, Wyoming.
HABITAT:	Barren clay flats in the Red Desert, 7700-7800 ft.
DESCRIPTION:	Perennial herbs with 1-4 unbranched stems from the base, the stems relatively stout, up to 20 cm long, prostrate or decumbent, often branched; basal leaves broad with petioles, several leaves on the stem; each stem with several to many yellow flowers and later with egg-shaped or spherical fruit, the fruit 8 mm long or more, on a recurved pedicel 5-10 mm long; stems and leaves covered with granular stellate trichomes, the fruit more sparsely so; style 2-3 mm long. Flowers in early to mid-May, fruit in late May or early June.
TAXONOMIC PROBLEMS:	This species is closely related to *L. fremontii* of southern Fremont County, Wyoming, but is always distinct and distinguishable from it. The two species never grow in the same area.
EXISTING OR POTENTIAL THREATS:	So far, this species is still only known from one medium-sized population. In recent years, this population has been depleted by a road which was built through the middle of the population (Robert Dorn, personal communication).
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management.
REMARKS:	Proposed as Endangered in Federal Register, June 16, 1976.

Lesquerella macrocarpa
U.S.D.A. Forest Service

Herbarium specimen in herbarium of New York Botanical Garden. Photo in R-2 Library

FABACEAE (LEGUMINOSAE)

SCIENTIFIC NAME:	Astragalus lutosus M. E. Jones.
ORIGINAL DESCRIPTION:	M. E. Jones, Contrib. West. Bot. 13:7 (1910). Also described by Barneby, Mem. N. Y. Bot. Gard. 13:785-787 (1964).
COMMON NAMES:	Dragon Milk-Vetch.
KNOWN DISTRIBUTION:	Rio Blanco and Garfield Counties, Colorado, and Uintah County, Utah.
HABITAT:	Ridges and hilltops of white clay derived from white shale, almost always derived from the Green River formation, barren of other vegetation, 5200-8500 ft.
DESCRIPTION:	Loosely matted from a submerged root-crown, perennial with short but obvious stems; leaves pinnate, with 15-27 leaflets, these leaflets crowded together, folded, fairly thick, up to 1 cm long, and covered with a thin, basifixed gray pubescence; stipules all free or nearly so; flowers white or lilac-tipped, large, 10-18 mm long; pods egg-shaped or ellipsoid, bladdery-inflated with papery walls, pale green with reddish tinges, sparsely hairy. Flowers in early-late May, fruit in June.
TAXONOMIC PROBLEMS:	None. This species is not very closely related to any other.
EXISTING OR POTENTIAL THREATS:	In the last few years, this species has been discovered in 20 or 30 new sites and many more probably remain to be discovered. Many of these populations are medium to large-sized; the species probably comprises over 10,000 individuals. At none of these sites has any Threat been noted.
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management, private.
REMARKS:	Proposed as Endangered in Federal Register, July 1, 1975; however, this species was not included in the Proposed List of Endangered Species in Federal Register, June 17, 1976, and was therefore not included in the original "Illustrated Guide."

POACEAE (GRAMINEAE)

SCIENTIFIC NAME:	Oryzopsis contracta (B. L. Johnson) Shechter.
ORIGINAL DESCRIPTION:	As Oryzopsis hymenoides (R. & S.) Ricker var. contracta B. L. Johnson, Bot. Gaz. 107:24 (1945). Also described by Shechter, Brittonia 18:342-343 (1966).
COMMON NAMES:	Unnamed Rice-Grass.
KNOWN DISTRIBUTION:	Albany, Carbon, and Sweetwater Counties, Wyoming; northern Larimer County, Colorado.
HABITAT:	Dry hills, plains, river valleys.
DESCRIPTION:	Perennial grass with upright stems 25-50 cm tall; leaves narrow, smooth, 4-20 cm long; ligule 3-6 mm long; similar to Oryzopsis hymenoides (Indian Rice-Grass) only with the panicle narrowly contracted and the panicle-branches slender; pedicels 3-10 mm long (8-18 mm in Oryzopsis hymenoides) at an angle of 2-20° with the branch below it (80-163°), shorter than the spikelet; lemma about 3-3.5 mm long (same), densely pubescent with hairs 1.2-1.9 mm long (2.4-3.3 mm); awn slightly bent, 7.0-8.7 mm long (3.9-5.6 mm). In the above description, the contrasting measurements for O. hymenoides are given in parenthesis. Flowers in late June or early July, fruit in mid- to late July.
TAXONOMIC PROBLEMS:	Originally described as a variety of O. hymenoides. Shechter & Johnson (1966) have shown that the differences between these two are consistent, even though obscure. The two are very similar in appearance in the field. However, they are apparently distinct species.
EXISTING OR POTENTIAL THREATS:	As far as known, no one has surveyed the populations of this species.
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management; private.
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975. This species was inadvertently left off the "Illustrated Guide" for Colorado, even though it has been known to occur in Colorado since it was described, and a specimen from the Laramie River in Larimer County, Colorado, was cited by Johnson (1944).

Oryzopsis contracta
U.S.D.A. Forest Service

Herbarium specimen in herb. of University of Wyoming, The Rocky Mountain Herbarium. Photo in R-2 Library

POLYGONACEAE

SCIENTIFIC NAME: *Eriogonum lagopus* Rydberg.

ORIGINAL DESCRIPTION: Rydberg, Flora Rocky Mts. 222 & 1061 (1917). Also described by Reveal (1969), pp. 146-147.

COMMON NAMES: Unnamed Wild-Buckwheat.

KNOWN DISTRIBUTION: Plains on both slopes of the Big Horn Mountains, in Sheridan and Big Horn Counties, Wyoming, and in adjacent southern Montana.

HABITAT: Tops of barren clay hills and ridges; near Lovell, Wyoming, seen growing in purplish slate that caps barren brown hills, 4000-6000 ft.

DESCRIPTION: Low spreading herbaceous perennials, 1.5-3 dm high and 1.5-3.5 dm across; leaves sheathing up the herbaceous stems 1.5-4 cm, the leaf-blades narrowly oblanceolate to spatulate, 1.5-3.5 cm long, 2-6 mm wide, tomentose; flowering stems erect, 5-10 cm long, tomentose; inflorescences cymose, 5-10 cm long and wide, tomentose; bracts scale-like, ternat e, 1-4 mm long, 1-2.5 wide; peduncles up to 8 mm long below, lacking above, erect, tomentose; involucres solitary, turbinate, 3-3.5 mm long, 2-5.5 mm wide, tomentose, 5-lobed; flowers yellow, 2-5.5 mm long, sparsely pubescent without, glabrous within, the tepals essentially similar; stamens slightly exserted, 2-2.5 mm long. Flowers in mid-late July, fruit in August and September.

TAXONOMIC PROBLEMS: Conservative floristic botanists in Wyoming after C. L. Porter and Dorn (1977) have considered this as a synonym of *E. brevicaule*. But Reveal has shown that it is distinct. Reveal began by calling it a variety of *E. pauciflorum*, then apparently realized the nature of *E. lagopus*, after which he considered it a separate species. Examination of the various herbarium specimens show that it is probably a distinct species. However, the western and eastern slope forms may represent different varieties (R. Dorn, personal communication). It is true that the habitat on which this species grows near Lovell is nowhere to be found close to Dayton (Sheridan County), the type locality.

EXISTING OR POTENTIAL THREATS: None have been seen or recorded, but the original locality for *E. lagopus* ("Dayton, Sheridan County, 4000 ft.") has not been seen in recent years; the reason for its disappearance or obscurity remains unknown.

LAND OWNERSHIP/ MANAGEMENT: Private, Bureau of Land Management.

REMARKS: Recommended as Threatened by Smithsonian (1978).

Eriogonum lagopus
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

POLYPODIACEAE

SCIENTIFIC NAME: Asplenium andrewsii A. Nelson.

ORIGINAL DESCRIPTION: A. Nelson, Proc. Biol. Soc. Wash. 17:174-175 (1904). Also described by Maxon in Contrib. U. S. Natl. Herb. 16 (1913).

COMMON NAMES: Andrews' Spleenwort.

KNOWN DISTRIBUTION: White Rocks, east-central Boulder County, Colorado.

HABITAT: Cracks and crevices of south-facing cliffs, in one thin stratum that is part of the Fox Hills sandstone, 5200-5300 ft.

DESCRIPTION: Small perennial fern with fronds tufted; stipes chestnut brown to blackish below, green above when mature; blades ovate-deltoid to elongate-deltoid, 3-10 cm long, bipinnate or ternate or tripinnate; pinnae deltoid below to lanceolate above, the segments ovate-lanceolate and incised-serrate; sori short but almost connected in a continuous chain on the pinnae; indusia straight, entire or nearly so (Harrington & Durrell - 1950, pp. 24-25).

TAXONOMIC PROBLEMS: This was considered as a distinct species by most botanists in the early part of this century: Aven Nelson, Rydberg, Underwood. However, Maxon (see his discussion in Contrib. U.S. Natl. Herb. 16 (1913)) apparently considered this as "a geographical phase of A. adiantum-nigrum." Harrington & Durrell (1950) and Harrington (1954) considered this as synonymous with A. adiantum-nigrum, but said, "The fern should be expected anywhere in the mountainous or rocky part of the State (Colorado)." Notwithstanding such optimism, this has not been found anywhere else in Colorado besides White Rocks; furthermore, the only other localities in the United States (Zion, Utah; Flagstaff, Arizona) apparently no longer have any plants of this species left. In recent years, botanists have returned to the opinion that the Colorado population represents a distinct species.

EXISTING OR POTENTIAL THREATS: This species was formerly of greater extent than at present to judge by Andrews' statements repeated in Nelson (1904); there apparently was at least one more population than is alive today. Development of gravel pits and land-clearing for housing

developments both are very active Threats to this species. In addition, there is a certain amount of air and water pollution at the site, which has had an unknown effect on this species. This species surely deserves the status of Endangered in the Endangered Species Act of 1973.

LAND OWNERSHIP/ MANAGEMENT: Private.

REMARKS: Recommended as Endangered by Smithsonian (1978).

Asplenium andrewsii
U.S.D.A. Forest Service

Photo in U.S.D.A. Forest Service R-2 Library

RANUNCULACEAE

SCIENTIFIC NAME:	Aquilegia caerulea James var. daileyae Eastwood.
ORIGINAL DESCRIPTION:	Eastwood, Proc. Calif. Acad. Sci. III 1:76 (1897).
COMMON NAMES:	Spurless Colorado Columbine
KNOWN DISTRIBUTION:	Occasionally along the eastern slope of the Front Range in Colorado, from Larimer, Jefferson, and Douglas Counties.
HABITAT:	Mature aspen stands, sometimes successional to Douglas-Fir; always associated with normal-spurred populations of A. caerulea, sometimes as continuous homogeneous sub-populations, sometimes as scattered spurless individuals within a normal-spurred population.
DESCRIPTION:	Like the normal-spurred Colorado Columbina, A. caerulea var. caerulea, but without spurs.
TAXONOMIC PROBLEMS:	This is probably not a good taxonomic variety, and in such a case does not qualify for protection under the Endangered Species Act. However, some question has been raised, because this spurless form is very beautiful and at least potentially exploited; the spurless form is apparently not protected under Colorado State law, as the normal-spurred form is.
EXISTING/POTENTIAL THREATS:	No Threats have been noted in any of the populations surveyed so far, however, the variety possesses a certain degree of potential for exploitation by horticulture.
LAND OWNERSHIP/ MANAGEMENT:	Pike National Forest (Pikes Peak Ranger District), Roosevelt National Forest (Red Feather Ranger District), Rocky Mountain National Park, private.
REMARKS:	Recommended as Endangered by Smithsonian (1978).

Aquilegia caerulea var. daileyae
U.S.D.A. Forest Service

Photograph by Harold W. Roberts; University of Colorado Museum Collection

RANUNCULACEAE

SCIENTIFIC NAME:	Aquilegia barnebyi Munz.
ORIGINAL DESCRIPTION:	Munz, Leaflets West. Bot. 5:177 (1949).
COMMON NAMES:	Barneby's Columbine.
KNOWN DISTRIBUTION:	West-central and southwestern Colorado in Rio Blanco, Garfield, Gunnison and Mineral Counties.
HABITAT:	Moist cliffs and crevices, on limestone or where alkaline deposits seep down from above; often in shaded situations, or under waterfalls, 6000-9000 ft.
DESCRIPTION:	Perennial herbaceous plants up to 8 dm tall, often forming large, rounded mounds of green foliage; leaves glaucous, glabrous, triternate, on petioles up to 25 cm long; flowers nodding from early flower, finally becoming suberect in fruit; flowers yellow with reddish-pink sepals; sepals 12-18 mm long, spurs 14-20 mm long with a bulbous nectary at their tips. Fruit of follicles 20-22 mm long, glandular-puberulent. Flowers late May to mid-June, fruit mid-June through July.
TAXONOMIC PROBLEMS:	Most of the plants included within this species now were listed in Harrington (1954) as A. triternata. As presently understood, that species is limited to Arizona and A. barnebyi limited to Colorado. Although it is agreed that the species of this genus need careful study in Colorado, A. barnebyi seems to be fairly distinct. At least it does not have any close relatives in Colorado.
EXISTING OR POTENTIAL THREATS:	No Threats have been noted at any population; several of the populations studied have medium to large populations and show good health.
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management; White River National Forest (Eagle and Rifle Ranger Districts); Gunnison National Forest (Taylor River Ranger District).
REMARKS:	Recommended as Endangered by Smithsonian (1978).

SCIENTIFIC NAME:	Aquilegia laramiensis A. Nelson.
ORIGINAL DESCRIPTION:	A. Nelson, Bull. Wyo. Expt. Sta. 28:78-79 (1896). Also described by Munz, Gent. Herb. 7:34-35 (1946).
COMMON NAMES:	Laramie Columbine
KNOWN DISTRIBUTION:	Laramie Hills and Laramie Mountains of Albany and Converse Counties, Wyoming.
HABITAT:	Crevices of cliffs and rock outcrops in shaded situations 7000-7500 ft.
DESCRIPTION:	Stems many from a perennial root, 5-25 cm tall, decumbent or ascending, leaves biternate, thin, green above and glaucous below, on petioles 3-15 cm long; flowers often hidden among the leaves or on stems that are shorter than the leaves; flowers nodding, cream-colored with greenish tinges, with sepals 10-15 mm long and spurs 5-8 mm long, hooked at their tips; fruit of follicles that are pilose and 1-1.4 cm long. flowers in June, fruit in late June or July.
TAXONOMIC PROBLEMS:	None known.
EXISTING OR POTENTIAL THREATS:	So far as known, no one has documented any Threats.
LAND OWNERSHIP/ MANAGEMENT:	Medicine Bow National Forest (Laramie Peak Ranger District, Laramie Ranger District); Bureau of Land Management; possibly State of Wyoming.
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975.

SAXIFRAGACEAE

SCIENTIFIC NAME:	Sullivantia hapemanii (Coulter & Fisher) Coulter
ORIGINAL DESCRIPTION:	As Heuchera hapemanii Coulter & Fisher, Bot. Gaz. 17:348 (1892). Additions to the descriptions made by Coulter, Bot. Gaz. 17:421 (1892).
COMMON NAMES:	None.
KNOWN DISTRIBUTION:	Mountains of south-central and north-central Wyoming, in Big Horn, Washakie, and Natrona Counties.
HABITAT:	Wet, shady rocks and cliffs, always on limestone or soil derived from limestone, often in cracks beside or beneath waterfalls, 4800-7500 ft.
DESCRIPTION:	Perennial herbaceous plants to 40 cm tall, from white, fibrous, woven roots, leaves mostly basal but one or two well-formed leaves on the stem; basal leaves on long petioles, with blades round or nearly so, lobed nearly one-third of the way to the base and these lobes then sharply several-toothed, green and shining; stems conspicuously glandular-pubescent and smelling like allspice when fresh; flowers small, white, with petals 1-2.5 mm long; fruit with 2 carpels and inferior by one-half or more. Flowers in late June or July, fruit in late July or August, depending on water availability at the site.
TAXONOMIC PROBLEMS:	Several botanists have recommended that this species be merged with S. purpusii, of central Colorado, but the two species are amply distinct. In any case, their distributions are very different.
EXISTING OR POTENTIAL THREATS:	None have been noted at any site. So far, this species is known from about eight or nine populations; many of these are large-sized and contain thousands of individuals. It is quite possible that more populations remain to be discovered in the future.
LAND OWNERSHIP/ MANAGEMENT:	Medicine Bow National Forest (Laramie Peak District), Bighorn National Forest (Paint Rock and Tensleep Districts); Bureau of Land Management; possibly private.
REMARKS:	Recommended as Threatened by Smithsonian (1978). This species is much like S. purpusii in general appearance; the reader should consult the photographs of that species.

Sullivantia hapemanii
U.S.D.A. Forest Service

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SCROPHULARICEAE

SCIENTIFIC NAME:	Mimulus gemmiparus W. A. Weber.
ORIGINAL DESCRIPTION:	W. A. Weber, Madroño 21:423-425 (1972).
COMMON NAMES:	Unnamed Monkey-Flower.
KNOWN DISTRIBUTION:	Rocky Mountain National Park, Grand and Larimer Counties, Colorado.
HABITAT:	"On gently sloping seeping granite slopes, forming colonies in the protection of the overhanging rounded surfaces of erratic boulders, subalpine, open sites in Picea-Abies-Populus tremuloides association, 9500-10,500 ft." (Weber 1972.)
DESCRIPTION:	Annual herb, totally glabrous; stems 1-10 cm tall, unbranched, with opposite leaves that are ovate, up to 10 mm long and 7 mm wide; petioles 2-3 mm long, laterally compressed and deeply saccate, containing a lens-shaped body that serves as a propogule for vegetative reproduction; flowers infrequently produced, solitary, yellow, not spotted, with short corolla 4-5 mm long. Flowering in early July (not often observed).
TAXONOMIC PROBLEMS:	Exact relationships unknown, but this mode of vegetative reproduction is unique in this genus.
EXISTING OR POTENTIAL THREATS:	As far as known, no one has surveyed the populations of this species for Threats, counted the number of individuals, nor searched for other populations.
LAND OWNERSHIP/ MANAGEMENT:	The known sites are all within Rocky Mountain National Park, but it is possible that this species will some day be found in Arapaho or Roosevelt National Forests.
REMARKS:	Recommended as Endangered by Smithsonian (1978).

SCROPHULARICEAE

SCIENTIFIC NAME:	Penstemon caryi Pennell.
ORIGINAL DESCRIPTION:	Pennell, Contrib. U. S. Natl. Herb. 20:354 (1920). Also described by Payson, Univ. Wyo. Publ. Bot. 1:96 (1924).
COMMON NAMES:	Unnamed Beard-Tongue.
KNOWN DISTRIBUTION:	Western slope of the Big Horn Mountains, in Big Horn County, Wyoming, and adjacent southern Carbon County, Montana.
HABITAT:	Rocky hillsides, nearly always with soil derived from limestone, often in sagebrush stands, sometimes in soils that have been lightly or temporarily disturbed, 5000-8500 ft.
DESCRIPTION:	Perennial herbaceous plants to 40 cm tall, glabrous and sparingly purplish-glaucous throughout; leaves narrow, opposite, 1-12 cm long, entire, pointed, folded; sepals 5 mm long, with long acuminate tips; corolla 15-40 mm long, with deep-blue throat and lobes, and lilac or magenta tube; anthers 1.4-1.5 mm long, conspicuously pubescent with long, entwined, crinkly hairs much longer than the anthers are wide; sterile stamen flattened and sparingly hairy with short hellow hairs. Flowers from mid-June through July, depending on altitude, fruit thereafter.
TAXONOMIC PROBLEMS:	The taxonomic situation of this species is unknown.
EXISTING OR POTENTIAL THREATS:	This species is known from about 15 populations so far, and some of these are at least of moderate size, with 200 individuals or more. As yet, no Threats have been noted; it is possible that more populations await discovery.
LAND OWNERSHIP/ MANAGEMENT:	Bighorn National Forest (Paint Rock, Medicine Wheel and possibly also Tensleep Ranger Districts); Bureau of Land Management; probably also private.
REMARKS:	Proposed as Threatened in Federal Register, July 1, 1975.

Penstemon caryi
U.S.D.A. Forest Service

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SCROPHULARIACEAE

SCIENTIFIC NAME:	Penstemon haydeni S. Watson.
ORIGINAL DESCRIPTION:	S. Watson, Bot. Gaz. 16:311 (1891).
COMMON NAMES:	Hayden's Beard-Tongue.
HABITAT:	Sandhills, in sandy soil at the edges of blowouts.
KNOWN DISTRIBUTION:	Sandhills of northwestern Nebraska, Cherry, Hooker and Thomas Counties, Nebraska.
DESCRIPTION:	Perennial herb in clumps from a near-horizontal rootstock with fibrous roots, stems erect, very leafy; the leaves narrow below, broad above with very pointed tips, hairless and very glaucous, clasping the stem, grading into the floral bracts which then cover or almost cover the flowers; calyx with sepals 8 mm long, attenuate to acuminate; corolla blue (fresh color now known), about 25 mm long, sterile stamen obviously enlarged at the tip, obviously bearded, especially toward the tip, with fairly long yellow hairs. Flowers in early June to early July; fruit thereafter.
TAXONOMIC PROBLEMS:	This species does not have any close relatives, although its exact relationships are unknown.
EXISTING OR POTENTIAL THREATS:	As far as known, no one has conducted field surveys of this species to determine if any Threats are present.
LAND OWNERSHIP/ MANAGEMENT:	Nebraska National Forest, also private.
REMARKS:	Recommended by Nebraska botanists.

SCROPHULARIACEAE

SCIENTIFIC NAME:	*Penstemon yampaensis* Penland.
ORIGINAL DESCRIPTION:	Penland, Madroño 14:156 (1958).
COMMON NAMES:	Unnamed Beard-Tongue.
KNOWN DISTRIBUTION:	Moffat County, Colorado.
HABITAT:	Forming loose mats on sandy, calcareous soil, knolls, flats, and bases of cliffs, in scattered sagebrush stands.
DESCRIPTION:	Perennial herbs, from caespitose multiple root-crowns but stems almost nonexistent, forming mats up to 30 cm in diameter but only 3 cm or less high; leaves 15-25 mm long, 2-4 mm wide, pointed, sparsely pubescent with scabrous hairs; flowers 2-6 on each root-branch, usually hidden among the leaves; calyx 5-9 mm long, long-acuminate, viscid-pubescent; corolla 15-18 mm long, lilac or with bluish tinge (drying to blue), glandular pubescent on the outside; anthers 1-1.5 mm long, glabrous; sterile stamen bearded all along its surface with short yellow hairs. Flowers in mid- to late June, fruit in July.
TAXONOMIC PROBLEMS:	This species was reported by Penland in Harrington (1954), but it was confused with *P. acaulis*, a very rare species which does not occur in Colorado, being only known from the Utah-Wyoming border some 90 miles to the west of *P. yampaensis*. The situation is very completely discussed in Penland (1958), where he argues convincingly that *P. yampaensis* is a distinct species. In any case, if this is ever made a variety of *P. acaulis* (which is unlikely), it would probably still be a good candidate for the Proposed list, at the least.
EXISTING OR POTENTIAL THREATS:	Two populations have been subjected to a preliminary survey, and they were found to be rather small; one of them is Threatened by a proposed dam. More careful studies need to be made of this species. It is interesting that *P. acaulis*, this species' closest relative, is considered truly Endangered by both Wyoming and Utah botanists.
LAND OWNERSHIP/ MANAGEMENT:	Bureau of Land Management.
REMARKS:	This species is a good candidate for the Proposed list.

III. GLOSSARY

Achene. Dry indehiscent one-seeded fruit, the seed connected to the pericarp at only one point.

Areole. Raised area on a cactus.

Annual. Completing the life cycle in one season.

Anthesis. Period when the flower is open.

Appressed. Lying flat or close against something.

Auriculate. With an ear-shaped lobe or appendage.

Banner. The upper, usually larger petal in a papilionaceous or "sweet pea type" flower.

Bifid. Two cleft or 2-lobed, usually at the apex.

Bract. A more or less modified leaf situated near a flower or inflorescence.

Biserial. In two rows or series, one above the other.

Calyx. The outer series of the perianth, used especially when it differs in size, shape, or color from the inner (or petals).

Campanulate. Bell-shaped, rather cup-shaped with a flaring rim.

Carinate. Keeled with one or more longitudinal ridges.

Caudex. The persistent, often woody base of an otherwise annual herbaceous stem.

Cauline. Of or pertaining to the stem.

Ciliate. Beset with a marginal fringe of hairs.

Cinereus. Color of ashes, gray tinged with black.

Connate. The union of like structures.

Cordate. Of a conventional heart shape; the point apical.

Culm. The specialized stem of grasses, sedges, and rushes.

Cuneate. Wedge-shaped; rather narrowly triangular, the acute angle downward.

Cymose. A flower cluster, often convex or flat-topped in which the central or terminal flower blooms earliest.

Deflexed. Bent or turned abruptly downward.

Deltoid. Shaped like the Greek letter delta, attached at the center of one side.

Dentate. Toothed with the teeth directed outward.

Divaricate. Widely spreading or diverging.

Entire. Margins without teeth or lobes.

Filament. The part of the stamen that supports the anther.

Follicle. A dry fruit with one carpel and splitting down one side only.

Glabrous. No hairs present at all; also used for smooth.

Glochid. A barbed hair or bristle.

Glume. A chaff-like bract; used particularly for the 2 lower empty bracts of a grass spikelet.

Gynophore. The stalk or stipe of a pistil when not sessile.

Hispid. With stiff and rigid bristles or bristle-like hairs.

Inflorescence. The flowering part of the plant, almost always used for a flower cluster.

Involucre. A whorl of distinct or united leaves or bracts subtending a flower or an inflorescence.

Keel. The name of the 2 anterior united petals of a papilionaceous "sweet pea" flower; a dorsal projecting usually central rib, like the keel of a boat.

Lemma. The scale or bract of a grass spikelet above the glumes; sometimes termed "flowering glume."

Ligulate. Strap-shaped.

Linear. Narrow and flat with sides parallel, like a grass leaf blade.

Monoecious. Flowers unisexual, but the staminate and pistillate ones borne on the same plant.

Node. The place on a stem where leaves or branches normally originate.

Nutlet. A small nut or nut-like fruit; used especially for the separating lobes of the mature ovary in Boraginaceae.

Oblanceoloate. Inversely lanceolate (lance-shaped) attached at the tapered end.

Obovate. Inversely ovate, attached at the narrow end.

Ovate. Egg-shaped in outline, attached at the wide end.

Panicle. A compound inflorescence with the younger flowers at the apex or center.

Pappus. The modified calyx limb in Compositae, forming a crown of various character at the summit of the achene.

Pedicel. The stalk to a single flower of an inflorescence; also used as a stalk to a grass spikelet.

Peduncle. The stalk to a solitary flower or to an inflorescence.

Perennial. A plant lasting 3 or more years; a stem not dying back over winter.

Perigynium. The more or less flask-shaped bract of carex enclosing the achene.

Pinnate. Compound leaf with the leaflets on 2 opposite sides of an elongated axis.

Pistillate. Provided with pistils, used when stamens are lacking.

Pubescent. Loosely used for covered with hairs; technically with short, soft hairs.

Pustulate. Beset with pimple-like elevated areas.

Raceme. An inflorescence with pedicelled flowers borne along a more or less elongated axis with the younger flowers nearest the apex.

Radicle. The primary rootlet of an embryo.

Receptacle. The more or less expanded portion of the flower stalk that bears the organs of a flower or the collected flowers in a head as in compositae.

Retrorse. Directed backward or downward.

Revolute. Rolled backward from each margin upon the lower side.

Rosette. A dense basal cluster of leaves arranged in circular fashion like the leaves of the common dandelion.

Scale. Any thin scarious body resembling the scale of a fish or reptile.

Scorpioid. Coiled at the apex like the tail of a scorpion.

Sepal. One of the parts of the outer whorl of the floral envelope or calyx, usually green in color.

Septum. Any kind of partition.

Sessile. Without a stalk of any kind.

Sigmoid. Doubly-curved like the letter S.

Silique. A fruit of the mustard family (Brassicaceae), dry, dehiscent and 2-celled, the septum (replum) thin with the 2 halves of the fruit peeling away from it. Often used to designate a mustard fruit that is larger than a silicle.

Sinuate. Strongly wavy-margined, deeper than undulate or repand.

Spatulate. Broad and rounded at the apex and tapering at base, like a druggist's spatula. Flattened spoon shaped.

Staminate. Bearing stamens only.

Stellate. Star-like or star-shaped with slender segments or hairs radiating out from a common center.

Stipule. An appendage at the base of the petiole or leaf at each side of its (leaf) insertion; often more or less united.

Stramineous. Straw-colored.

Strigose. With appressed, stiff, rather short hairs.

Stylopodium. A disk-like expansion of the base of the style as in Apiaceae.

Suture. A junction or seam of a union; a line of dehiscence.

Ternate. Arranged in threes.

Tomentose. With a dense wool-like covering of matted, intertangled hairs of medium length.

Trichome. A hair-like outgrowth of the epidermis.

Trigonous. Three-angled.

Truncate. Squared at the tip or base as if cut off with a straight blade.

Tubercle. A small rounded structure, often pimple like.

Utricle. A small thin-walled one-seeded fruit; any bladder-like body.

Viscid. Glutinous, sticky, or gummy to the touch.

Valve. One of the parts or segments into which a dehiscent fruit splits.

Wing. One of the lateral petals in a papilionaceous corolla.

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? Astragalus humillimus 61
Astragalus naturitensis 67
Atriplex pleiantha 53
Sclerocactus mesae-verdae 49

Unknown Ownership

? Arabis demissa var. russeola 126 (Laramie Hills)
? Astragalus humillimus 61 (Mesa Verde region)
? Cryptantha aperta 18 (vicinity of Grand Junction)
? Rorippa coloradensis 41 ("southern Colorado")

VII. DISTRIBUTION OF SPECIES BY STATE AND COUNTY

Colorado

Alamosa
- Rorippa coloradensis

Archuleta
- Lesquerella pruinosa
- Pediocactus knowltonii

Boulder
- Asplenium andrewsii
- Draba exunguiculata
- Phippsia algida

Chaffee
- Eriogonum brandegei

Clear Creek
- Draba exunguiculata
- Phippsia algida

Costilla
- Hymenoxys helenioides

Delta
- Eriogonum pelinophilum
- Penstemon retrorsus
- Sclerocactus glaucus

Douglas
- Aquilegia caerulea var. daileyae
- Gaura neomexicana ssp. coloradensis

Fremont
- Eriogonum brandegei
- Parthenium ligulatum

Garfield
- Aquilegia barnebyi
- Arabis oxylobula
- Astragalus lutosus
- Astragalus wetherillii
- Festuca dasyclada
- Sclerocactus glaucus
- Sullivantia purpusii

Gilpin
- Draba exunguiculata

Grand
- Astragalus osterhoutii
- Draba exunguiculata
- Mimulus gemmiparus

Gunnison
- Aquilegia barnebyi
- Arabis gunnisoniana
- Astragalus microcymbus
- Draba oligosperma var. pectinipila
- Senecio porteri
- Stellaria irrigua
- Sullivantia purpusii

Hinsdale
- Cryptantha weberi
- Hymenoxys helenioides
- Senecio porteri
- Stellaria irrigua

Huerfano
- Neoparrya lithophila
- Stellaria irrigua

Jackson
- Artemisia argilosa
- Phacelia formosula

Jefferson
- Aquilegia caerulea var. daileyae

Lake
- Phippsia algida

La Plata
- Stellaria irrigua
- Pediocactus knowltonii

Las Animas
- Oonopsis foliosa var. monocephala

Larimer
- Aletes humilis
- Aquilegia caerulea var. daileyae
- Gaura neomexicana ssp. coloradensis
- Mimulus gemmiparus
- Oryzopsis contracta

Colorado (Cont'd)

Mesa
- Astragalus linifolius
- Astragalus wetherillii
- Cryptantha aperta
- Cryptantha elata
- Echinocereus triglochidiatus var. inermis
- Phacelia submutica
- Sclerocactus glaucus

Mineral
- Aquilegia barnebyi
- Stellaria irrigua

Moffat
- Arabis demissa var. russeola
- Cryptantha stricta
- Eriogonum viridulum
- Oxytropis obnapiformis
- Parthenium ligulatum
- Penstemon yampaensis

Montezuma
- Aquilegia micrantha var. mancosana
- Astragalus deterior
- Astragalus humillimus
- Astragalus naturitensis
- Astragalus schmollae
- Sclerocactus mesae-verdae

Montrose
- Astragalus linifolius
- Astragalus naturitensis
- Echinocereus triglochidiatus var. inermis
- Penstemon retrorsus
- Sullivantia purpusii

Ouray
- Senecio porteri
- Stellaria irrigua

Park
- Braya humilis ssp. ventosa
- Draba exunguiculata
- Eriogonum brandegei
- Eutrema penlandii
- Phippsia algida

Pitkin
- Senecio porteri

Pueblo
- Parthenium tetraneuris

Rio Blanco
- Aquilegia barnebyi
- Astragalus detritalis
- Astragalus lutosus
- Eriogonum ephedroides
- Parthenium ligulatum

Saguache
- Cryptantha weberi

San Miguel
- Stellaria irrigua

San Juan
- Senecio porteri
- Stellaria irrigua

Summit
- Draba exunguiculata
- Eutrema penlandii
- Phippsia algida
- Saussurea weberi

Weld
- Gaura neomexicana ssp. coloradensis
- Parthenium alpinum

Kansas

Allen
- Asclepias meadii

Douglas
- Asclepias meadii

Miami
- Asclepias meadii

Nebraska

Cherry
- Penstemon haydeni

Hooker
- Penstemon haydeni

Thomas
- Penstemon haydeni

Wyoming

Albany
? Aletes humilis
Aquilegia laramiensis
Arabis demissa var. languida
Arabis demissa var. russeola
Oryzopsis contracta
Sphaeromeria simplex

Big Horn
Eriogeron allocotus
Eriogonum lagopus
Penstemon caryi
Sullivantia hapemanii

Carbon
Oryzopsis contracta
Parthenium alpinum

Converse
Aquilegia laramiensis

Fremont
Antennaria arcuata
Arabis demissa var. russeola
Lesquerella fremontii
Townsendia spathulata

Natrona
Parthenium alpinum
Sullivantia hapemanii
Townsendia spathulata

Park
Draba nivalis var. brevicula
Draba oligosperma var. pectinipila
Phippsia algida

Platte
Parthenium alpinum

Sheridan
Eriogonum lagopus

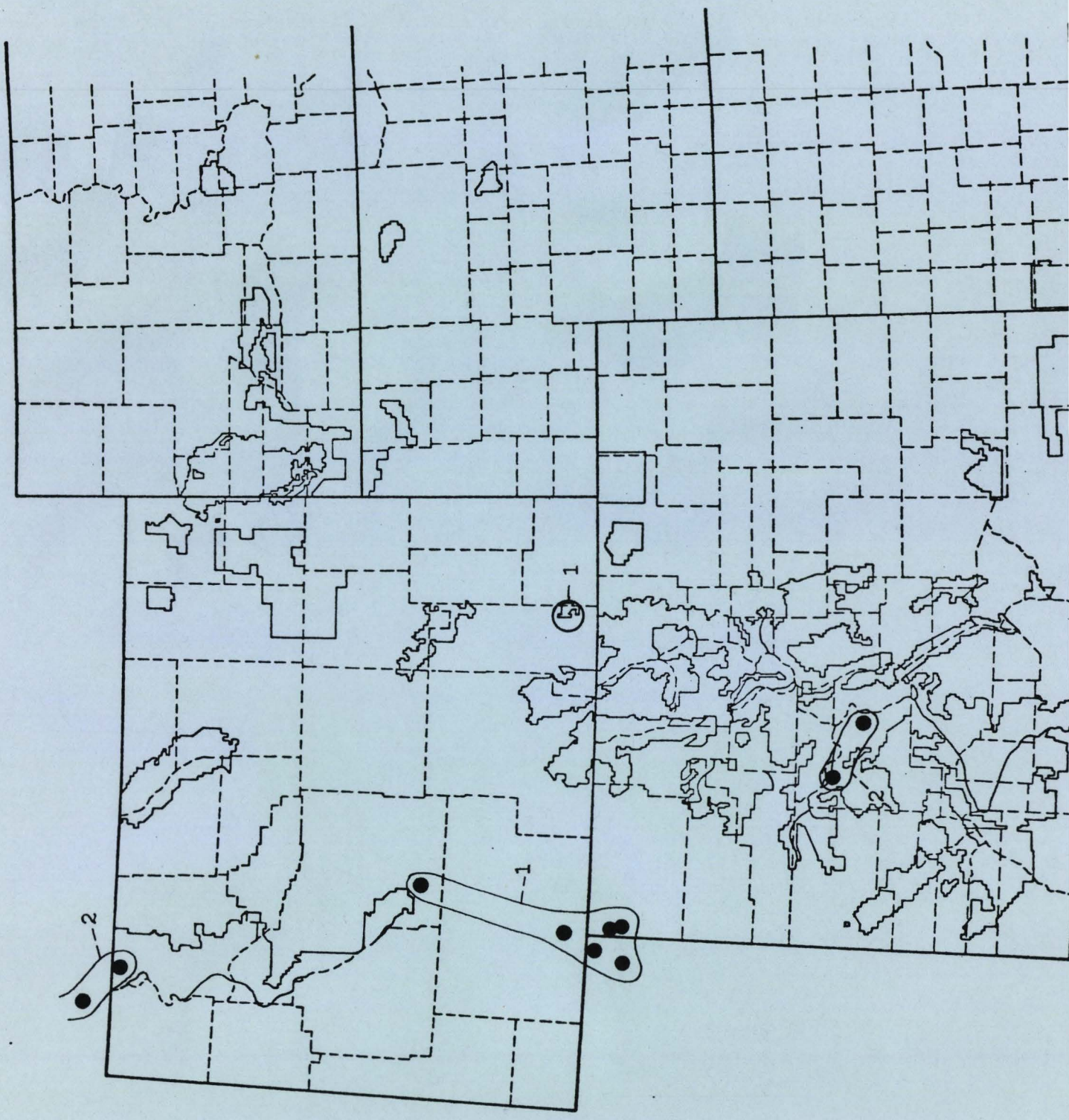
Sweetwater
Arabis demissa var. languida
Arabis demissa var. russeola
Lesquerella macrocarpa
Oryzopsis contracta
Parthenium ligulatum
Townsendia spathulata

Washakie
Erigeron allocotus
Sullivantia hapemanii

VIII. DISTRIBUTION MAPS

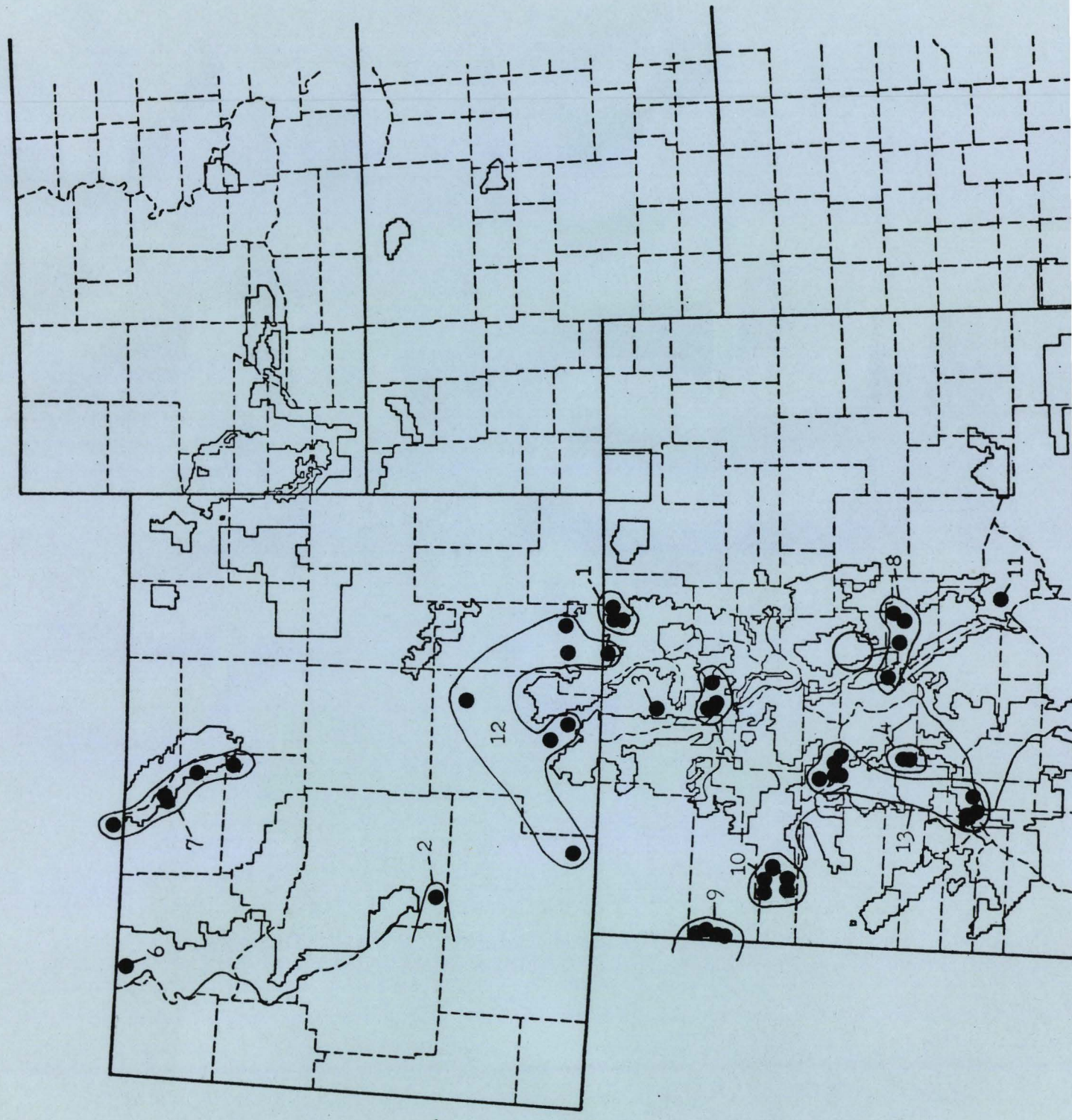
Map 1.

1. Arabis demissa var. russeola
2. Draba oligosperma var. pectinipila



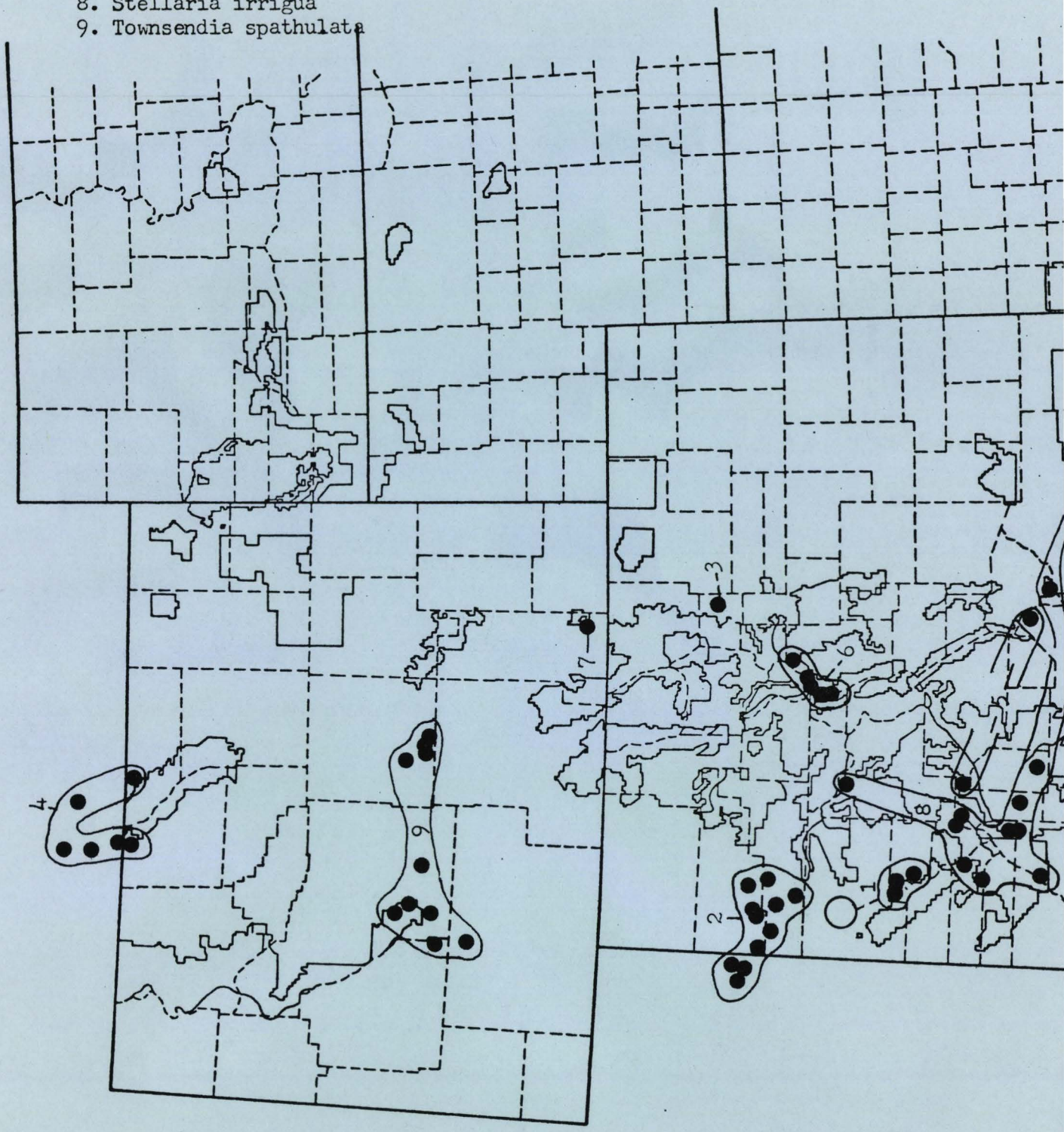
Map 2.

1. Aletes humilis
2. Antennaria arcuata
3. Artemisia argilosa
4. Astragalus microcymbus
5. Astragalus osterhoutii
6. Draba nivalis var. brevicula
7. Erigeron allocotus
8. Eriogonum brandegei
9. Eriogonum ephedroides
10. Festuca dasyclada
11. Neoparrya lithophila
12. Oryzopsis contracta
13. Senecio porteri



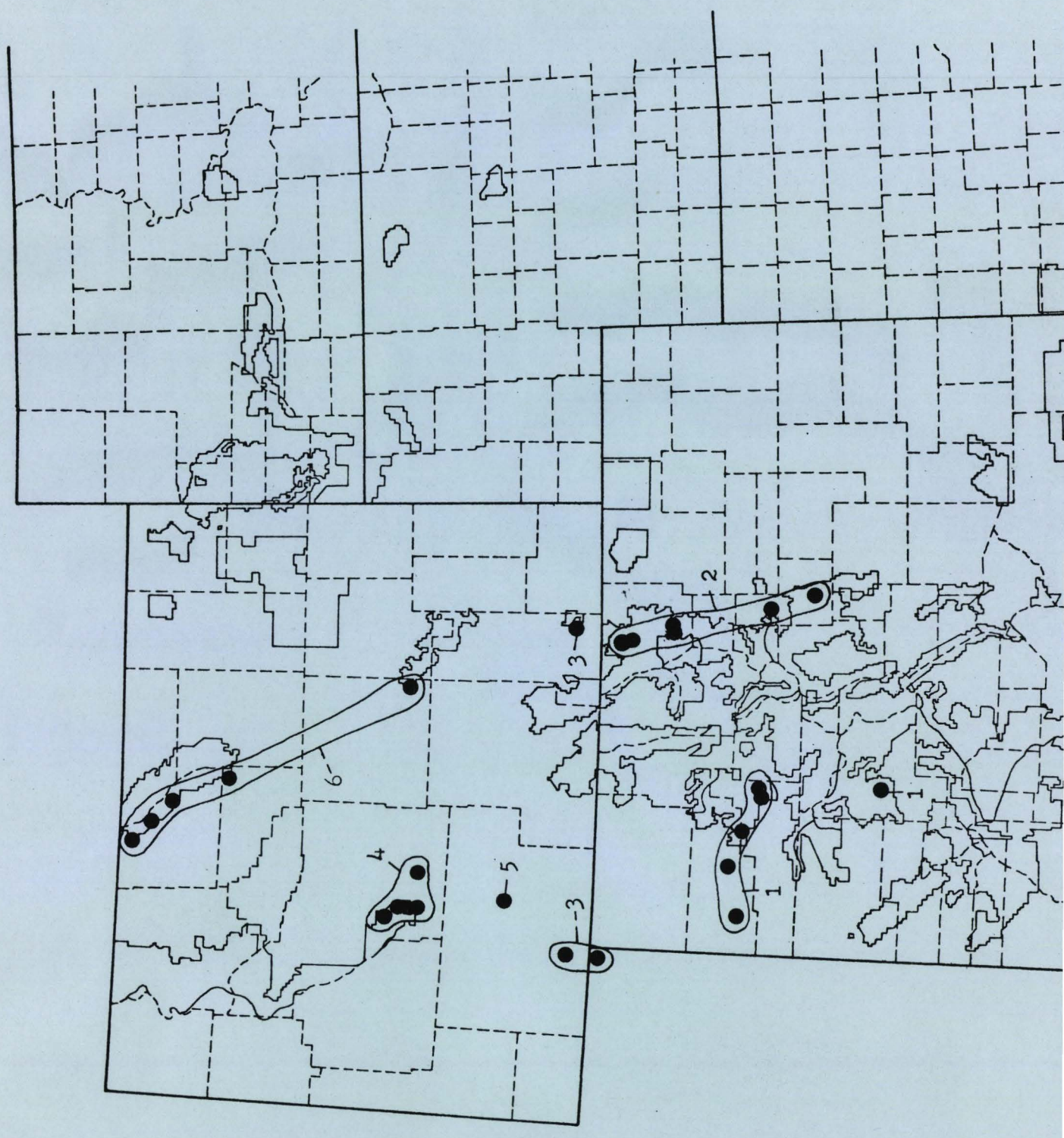
Map 3.

1. Astragalus linifolius
2. Astragalus lutosus
3. Asplenium andrewsii
4. Eriogonum lagopus
5. Hymenoxys helenioides
6. Saussurea weberi
7. Sphaeromeria simplex
8. Stellaria irrigua
9. Townsendia spathulata



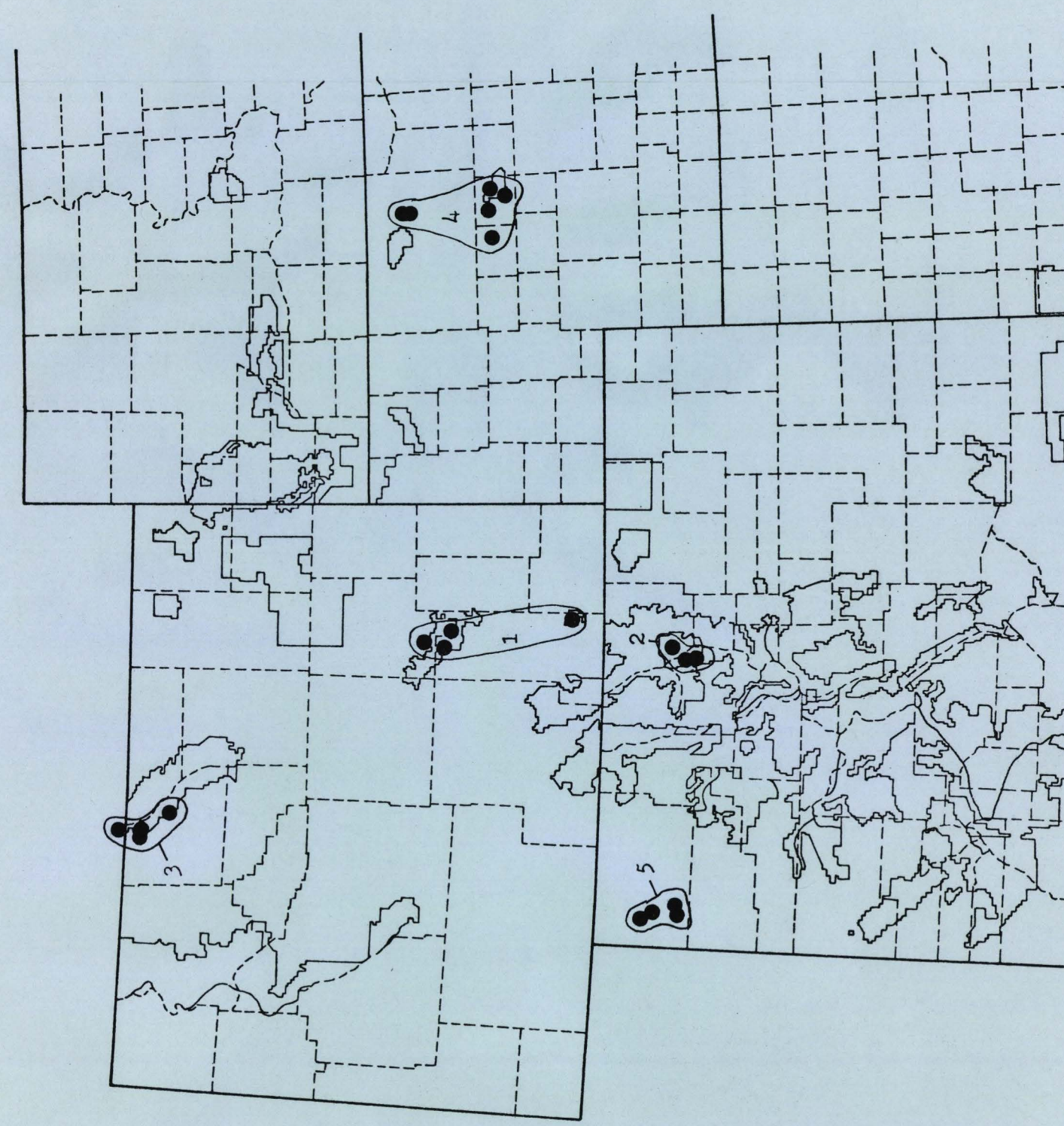
Map 4.

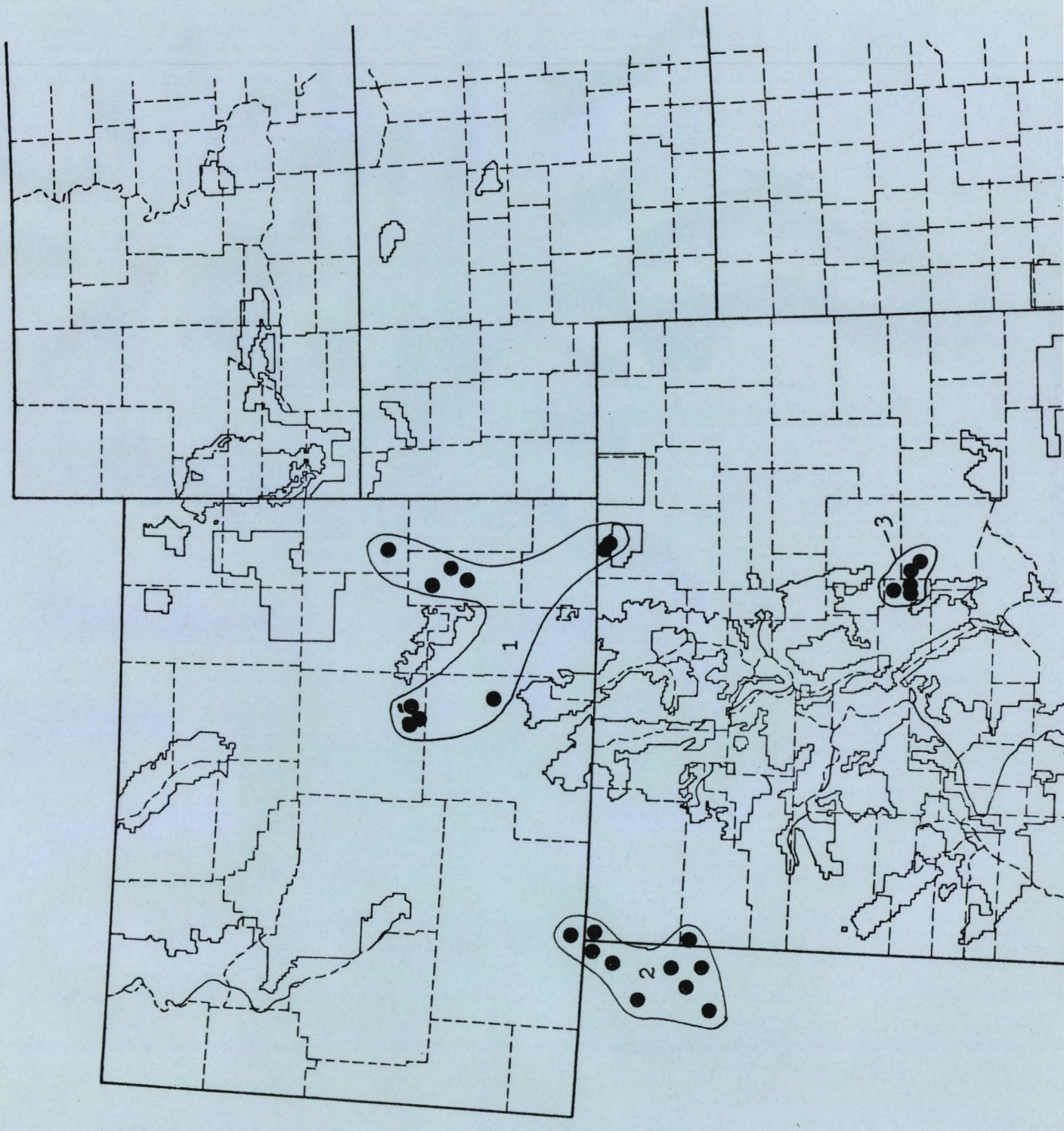
1. Aquilegia barnebyi
2. Aquilegia caerulea var. daileyae
3. Arabis demissa var. languida
4. Lesquerella fremontii
5. Lesquerella macrocarpa
6. Sullivantia hapemanii



Map 5.

1. Aquilegia laramiensis
2. Mimulus gemmiparus
3. Penstemon caryi
4. Penstemon haydeni
5. Penstemon yampaensis



Map 6.

1. Parthenium alpinum
2. Parthenium ligulatum
3. Parthenium tetraneuris